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Duration of Immunity Conferred by Typhoid Vaccine*

Results of Re-vaccination by Intracutaneous Injection of Typhoid Vaccine

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TWO progress reports have been published on the studies being made of typhoid vaccine in the laboratories of the Army Medical School.[1, 2]

During the past two years we have had the opportunity to undertake experimental studies with a view to estimating the duration of the protection afforded by the vaccine. Also, a study has been made of the value of re-vaccination with a single small dose of vaccine intracutaneously injected. This paper is a progress report of these two phases of our studies of typhoid vaccine.

DURATION OF IMMUNITY

The presence of protective antibodies in the blood stream after vaccination with typhoid vaccine is one indication of immunity, and the persistence of such antibodies over a period of time may be utilized to estimate the duration of the immunity conferred by the vaccine. In conducting these studies, we have used the mouse protection test to measure the antibody content of the blood serum. The mouse protection test measures the passive immunity conferred on mice by the inoculation of blood serum of an immunized individual. This test, as we have used it in our work, has been described in a previous communication.[2]

Preliminary to the experimental

* Presented by Lieut. Colonel G. C. Dunham, M.C., before the Laboratory Section of the American Public Health Association at the Sixty-seventh meeting in Kansas City, Mo., October 26, 1938.

studies regarding duration of immunity in vaccinated individuals, a study was made of a group of individuals who had never been vaccinated and who presented no history of having had typhoid fever. In all tests made before vaccination a constant dose of 10,000 organisms was used against 0.1 c.c. of individual's serum, on the assumption that if 0.1 c.c. of the blood serum of an individual afforded mice no protection against 10,000 live virulent typhoid organisms, the individual, arbitrarily, could be considered non-immune. This method was used as a screening test to eliminate those who were highly immune, and to conserve mice; also, because of the difficulty of determining the end point where the protective antibody content of the serum is very low.

All such tests were controlled by injection into groups of mice of 10, 100, and 1,000 organisms without serum, to determine the minimum lethal dose of the culture being used. In this series of observations, it was found that the minimum lethal dose for the control mice was either 100 or 1,000 organisms. Consequently, where, for example, an individual's serum did not protect mice against the dose of 10,000 organisms, the number of m.l.d. against which that serum, theoretically, would afford no protection might be as low as 10 or 100, depending on the virulence of the culture used. In Table I, the results of the tests are expressed as the number of m.l.d. of the test organism (Strain No. 63 *infra*) against which the serum protected or failed to protect mice.

A constant dose of 10,000 organisms was used in testing sera before vaccination. In some of the cases included in this study, 10,000 organisms of the culture used represented 100 m.l.d. for the control mice, while in other cases 10,000 organisms represented only 10 m.l.d. The former are placed in the first group and the latter in the second group in Table I. It is possible that the blood sera of many of the 176 persons in the first group which failed to protect mice against 100 m.l.d., would also have failed to protect against 10 m.l.d. had 1,000 instead of 10,000 test organisms been used.

Apparently, in many instances, the adult individual possesses some immunity to typhoid fever, even though he has not had typhoid fever in a diagnosable form and has never been immunized by vaccination. Our studies indicate that the protective antibody content of the blood sera of a large proportion of these individuals is relatively low, as compared with that of vaccinated persons. As shown in Table I, the blood sera of 79 per cent of the first group of 222 persons failed to protect mice against 100 m.l.d. of the test

TABLE I

Protective Antibody Content of Blood Sera of Individuals Not Vaccinated. Results Are Expressed as the Number of Minimum Lethal Doses of the Test Organism Against Which the Serum of the Individual Tested Protected, or Failed to Protect, Mice

	*First Group 100 * m.l.d.*		*Second Group 10 * m.l.d.*		*Total*	
	Number	*Percentage*	*Number*	*Percentage*	*Number*	*Percentage*
Protected	46	21	51	24	97	22
Failed to protect	176	79	163	76	339	78
Total	222	100	214	100	436	100

* The test dose consisted of 10,000 organisms and represented either 10 or 100 minimum lethal doses, depending upon the virulence of culture used.

organism, and 76 per cent of the second group of 214 failed to protect against 10 m.l.d.

In this study, the blood sera of 21 per cent of the first group and 24 per cent of the second group protected mice against more than 100 m.l.d. and 10 m.l.d., respectively. It is quite probable that the group contained some individuals who had had undiagnosed typhoid fever, in which case their blood sera would have protected mice against a much higher number of m.l.d. Obviously, the use of a single fixed dose of organisms, the technic first adopted for all preliminary titrations, even though it amply sufficed to pick out the non-immunes, would give no definite information concerning immunes. In our more recent work we are expanding the dosage in such manner as will enable us to secure the end point in all preliminary titrations.

A group of 200 individuals was studied with a view to determining the protective antibody content of the blood serum shortly after immunization. In each instance, the blood was taken on the 14th day after the third inoculation of typhoid vaccine. No one of this group had received more than the one course of vaccine, and none gave a history of having had typhoid fever. The results are shown in Table II, and are expressed in multiples of the m.l.d. of the test organism against which 0.1 c.c. of the individual's serum completely protected mice.

The results of the tests, as shown in Tables II, III, and IV, are expressed in terms of complete protection afforded mice against multiples of the m.l.d. for mice of a virulent strain of the typhoid bacillus suspended in mucin (5 per cent). A strain designated in our laboratories as Strain No. 63 was used for this purpose.

It will be noted in Table II that 2 weeks after vaccination the blood sera protected mice against from a minimum of 1,000 to a maximum of 1,000,000 m.l.d. of the test organism. In 80 per cent of the observations, the sera protected against at least 10,000 m.l.d.

TABLE II

Protective Antibody Content of Blood Sera of 200 Persons 2 Weeks After Vaccination. Results Are Expressed as Number of Minimum Lethal Doses of the Test Organism Against Which the Serum of the Immunized Individual Protected Mice

Minimum Lethal Doses	*Number of Persons*	*Percentage*
1,000,000	4	2.0
100,000	35	17.5
10,000	121	60.5
1,000	40	20.0
Total	200	100.0

Three groups of individuals have been studied with regard to the duration of immunity for varying periods of time. In one group, consisting of 56 persons, the blood sera were retitrated from 12 to 17 months after the initial vaccination. In another group of 30 individuals, the blood sera were retitrated after an interval of from 24 to 29 months subsequent to initial vaccination. In all instances, the individuals comprising these two groups were immunized with vaccine made from a virulent strain (Strain No. 58) and the blood sera had been titrated 2 weeks after initial vaccination. None of those included in this study gave a history of previous vaccination or of having had typhoid fever. The results obtained are shown in Table III.

It is apparent that the number of observations in Table III are too few to permit drawing definite conclusions on a statistical basis. However, the results obtained, while subject to confirmation by additional studies, do indicate the trend in the persistence of immunity as conferred by immunization with typhoid vaccine, in so far as

TABLE III

Protective Antibody Content of Blood Sera of 56 Persons 12 to 17 Months, and of 30 Persons 24 to 29 Months Subsequent to Vaccination with Typhoid Vaccine. Results Are Expressed in Minimum Lethal Doses of the Test Organism Against Which the Serum of the Individual Protected Mice *

Minimum Lethal Doses	12 to 17 Months After Vaccination		24 to 29 Months After Vaccination	
	No. of Persons	Percentage	No. of Persons	Percentage
10,000	12	21.4	1	3.3
1,000	27	48.2	13	43.4
100	17	30.4	9	30.0
10	..	....	6	20.0
1	..	....	1	3.3
Total	56	100.0	30	100.0

* Two weeks subsequent to vaccination these blood sera protected mice against from 1,000 to 1,000,000 m.l.d. of the test organism.

the mouse protection test can be used as a measure of the immunity possessed by the individual.

Twelve to 17 months after immunization the blood sera protected mice against from 100 to 10,000 m.l.d. of the test organism. Twenty-four to 29 months after vaccination the blood sera protected mice against from 1 to 10,000 m.l.d. (Table III).

During a period of 12 to 17 months subsequent to vaccination, the blood sera of 39 of the 56 individuals, or 69 per cent of the group, afforded mice complete protection against at least 1,000 m.l.d. of the test organism. Two years after vaccination the blood sera of 14 of the 30 individuals, or 46 per cent of the group, protected mice against 1,000 lethal doses of the test organism.

Despite the relatively great decrease in the protective antibody content of the blood in from 1 to 2 years subsequent to immunization, as measured by the mouse protection test, the average member of the groups observed, and the majority of the individuals involved, still have considerable immunity 1 year and 2 years after vaccination, as is indicated by the persistence of protective antibodies sufficient to protect mice against a relatively large number of minimum lethal doses of the test organism.

The third group consists of 311 individuals who had been vaccinated from one to several times, and among whom the time interval since the last vaccination ranged from 1 year to more than 10 years (Table IV). No data are available relative to the protective antibody content of the blood sera 2 weeks after vaccination, as for the groups discussed above (Tables II and III).

The blood sera of the members of the group who received their last course of vaccine 12 to 24 months previously protected mice against from 1 to 10,000 m.l.d. of the test organism. The blood sera of 62 per cent of this group protected mice against at least 1,000 m.l.d. These findings are comparable to those shown in Table III.

The blood sera of the members of the group vaccinated from 24 to 36 months before they were tested also protected mice against from 1 to 10,000 m.l.d., and 35 per cent of the sera protected mice against at least 1,000 m.l.d.

Thereafter, the protective antibody content of the blood sera of individuals

TABLE IV

Protective Antibody Content of Blood Sera of Previously Immunized Individuals at Different Periods of Time Subsequent to Last Vaccination. Results are Expressed in Minimum Lethal Doses of the Test Organism Against Which the Serum of the Individual Protected Mice

Minimum Lethal Doses	Time Since Last Vaccination									
	12–24 Months		25–36 Months		4–5 Years		6–10 Years		More than 10 Years	
	No. of Persons	Per cent	No. of Persons	Per cent	No. of Persons	Per cent	No. of Persons	Per cent	No. of Persons	Per cent
10,000	19	16.5	2	2.2	..	....	..	....	..	....
5,000	4	3.5	3	3.2	22	52.4	9	29.0	11	36.7
1,000	48	41.7	28	30.1	15	35.7	17	54.8	14	46.6
100	42	36.5	37	39.8	5	11.9	3	9.7	5	16.7
10	1	0.9	19	20.4	..	....	2	6.5	..	....
1	1	0.9	4	4.3	..	....	..	....	..	....
Total	115	100.0	93	100.0	42	100.0	31	100.0	30	100.0

last vaccinated from 4 to 5 years, 6 to 10 years, and more than 10 years prior to the time of testing decreased gradually and more slowly. While the numbers of persons involved in the 4 to 5 years, 6 to 10 years, and more than 10 years groups are relatively small, the results suggest that some degree of immunity persists for a long period of time—more than 10 years—after immunization with typhoid vaccine. It should be noted, however, that most of the members of these groups had been vaccinated two or more times.

COMMENT

Determination of the protective antibody content of the blood subsequent to immunization with typhoid vaccine, through the ability of the blood serum to confer passive immunity to mice, cannot be considered as measuring the total potential defense response of the immunized individual to typhoid fever. However, the production of immune substances and their presence in the blood, as shown by the mouse protection test, is a part of the response of the defense mechanism of the tissues to the inoculation of typhoid vaccine, and is demonstrable evidence of immunity to infection with *E. typhosa*.

As shown in Table II, the degree of immunity present in different individuals 2 weeks after vaccination varies widely. At this time all of the blood sera tested protected mice against at least 1,000 m.l.d. of the test organism, and 80 per cent protected against at least 10,000 doses, 20 per cent against 100,000 doses, and 2 per cent against one million m.l.d. Immediate protective antibody concentration in the blood serum sufficient to protect mice against 1,000 minimum lethal doses of virulent organisms appears to represent the minimum immunity conferred by vaccination with typhoid vaccine, when given in three subcutaneous injections of 0.5 c.c., 1 c.c., and 1 c.c. at weekly intervals. As epidemiological evidence indicates that immunization with typhoid vaccine protects against infection for some time after vaccination, it is believed the assumption is justified that if the blood serum will protect against 1,000 m.l.d., the individual has suffi-

cient immunity to protect him against dosages of the organism ordinarily encountered in nature. Undoubtedly some, if not a large majority, of immunized persons whose blood sera will not protect mice against less than 1,000 m.l.d. are still immune to typhoid fever.

The data presented in Tables III and IV indicated that during the second year after immunization the blood sera of 69 per cent of a group of 56 persons, and 62 per cent of a group of 115 persons protected mice against 1,000 to 10,000 m.l.d. Also, that during the third year after vaccination the blood sera of 46 per cent of a group of 30 persons, and 35 per cent of a group of 93 persons protected mice against 1,000 or more m.l.d.

Not only does the degree of immunity produced by immunization with typhoid vaccine vary greatly in different individuals, in so far as can be judged by the mouse protection tests, but the duration of the immunity conferred by vaccine is also subject to wide variations. Because of these variations, it would be impossible to determine if any one person was immune at any given time, without testing his blood serum. However, it appears from the results of these studies that a large proportion of immunized persons are protected for at least 2 to 3 years after vaccination.

SUMMARY

Several groups of individuals have been studied with a view to determining, by means of the mouse protection test, the concentration of protective antibodies in the blood at intervals of time subsequent to immunization with typhoid vaccine.

Prior to vaccination, the sera of 79 per cent of one group of individuals tested failed to protect mice against 100 m.l.d. of a live virulent test organism, and 76 per cent of another group failed to protect against 10 m.l.d. of the test organism.

Within 2 weeks after vaccination the antibody content of the blood sera tested increased rapidly to a comparatively high level. There was a relatively rapid decrease in circulating antibodies during the 2 year period subsequent to vaccination. Thereafter, the decrease was more gradual and 10 or more years after the last vaccination the antibody concentration in the blood was sufficient to suggest that a large proportion of the individuals tested still possessed considerable immunity to typhoid fever.

During the second year after vaccination, 69 per cent of one group of immunized individuals and 62 per cent of another group protected mice against 1,000 m.l.d. of the test organism. During the third year subsequent to immunization, 46 per cent of the blood sera of one group and 35 per cent of another group protected mice against 1,000 m.l.d. of the test organisms.

CONCLUSIONS

1. Experimental evidence based on mouse protection tests indicates that there is a material decrease in protective antibodies in the blood during the first and second years subsequent to immunization with typhoid vaccine.

2. The decrease in the protective antibody content of the blood is the greatest during the first 2 years after vaccination, and is comparatively slow thereafter.

3. The protective antibody content of the blood of the average individual for as long as 10 years subsequent to immunization with typhoid vaccine is sufficient to indicate that he still possesses considerable immunity to typhoid fever. The results obtained by this study suggest that persons who have been immunized with typhoid vaccine should be re-vaccinated from 2 to 4 years after initial vaccination.

RE-VACCINATION BY INTRACUTANEOUS INJECTION

Where immunization is employed to control typhoid fever in civilian com-

munities, or among troops, re-vaccination is usually considered necessary. It has been customary in re-vaccination against typhoid fever to use the same dosage of vaccine and the same methods of administering the vaccine as in original vaccination. That is, three subcutaneous injections of vaccine at about weekly intervals. This method is time consuming, and, not infrequently, in persons who have been vaccinated several times, causes rather severe reactions.

It is known that in immunizing against certain diseases other than typhoid fever, one dose of antigen will elicit an immunological response in previously immunized persons. In view of this, we have undertaken a study to determine if one dose of typhoid vaccine would stimulate the defense mechanism in previously vaccinated persons and, if so, the degree of response that results from such a stimulus.

A group of 100 individuals were each given one dose of 0.1 c.c. of typhoid vaccine (100 million organisms) intracutaneously in the arm or forearm. All had been immunized with typhoid vaccine from 2 to 10 years, or more, prior to re-vaccination. Some had received two or more courses of the vaccine.

Blood specimens were taken immediately before and 14 days after re-vaccination. The blood sera were titrated by the mouse protection test, using 0.1 c.c. of the individual's serum against multiple m.l.d. of the test organism (Strain No. 63 *supra*) for normal mice. The results are shown in Table V.

Before re-vaccination, the blood sera of members of this group protected mice against from 1 to 10,000 m.l.d. of the test organism. In 71 per cent of the observations the blood sera failed to protect mice against 1,000 m.l.d. and 21 per cent failed to protect mice against 100 m.l.d. (Table V-A).

TABLE V

Protective Antibody Content of Blood of 100 Persons Before Vaccination and 2 Weeks After Vaccination with 0.1 c.c. of Typhoid Vaccine Intracutaneously. The Protection Expressed as the Number of Minimum Lethal Doses of the Test Organism Against Which the Sera Protected Mice

A

Before Vaccination

Protection in m.l.d.	*Number of Persons*
10,000	1
5,000	2
1,000	26
500	10
100	40
10	16
1	5
Totals	100

B

Two Weeks After Vaccination

Protection in m.l.d.	*Number of Persons*
100,000	7
50,000	3
10,000	66
5,000	3
1,000	21
Totals	100

After re-vaccination, the blood sera protected mice against from 1,000 to 100,000 m.l.d. In 76 per cent of the cases, the blood sera protected mice against at least 10,000 m.l.d. (Table V-B).

COMMENT

The results of a study of the protective antibody content of the blood sera of 200 individuals 2 weeks after original vaccination with a series of three injections of typhoid vaccine have been tabulated in Table II. It will be seen that in this group 20 per cent of the sera protected mice against at least 1,000 m.l.d., and 80 per cent of the sera protected against at least 10,000

m.l.d. In comparison, in the re-vaccination of a group of 100 persons with one dose of vaccine (0.1 c.c.) administered intracutaneously (Table V), 21 per cent of the blood sera obtained 2 weeks after re-vaccination protected mice against 1,000 m.l.d. of test organisms, and 76 per cent protected mice against at least 10,000 m.l.d. Three per cent protected mice against 5,000 m.l.d.

The results of these two studies are comparable, and indicate that the immediate immunological response to re-vaccination with one intracutaneous injection of 0.1 c.c. of typhoid vaccine is approximately the same as that which occurs after the first vaccination with three subcutaneous injections of 0.5 c.c., 1 c.c., and 1 c.c., respectively.

Re-vaccination with one small intracutaneous dose of typhoid vaccine has the advantage that it is, obviously, a much simpler procedure than is a method requiring three subcutaneous injections at weekly intervals. Also, the reaction is, almost without exception, much milder than that produced by subcutaneous injection of 0.5 c.c. or 1 c.c. of the vaccine.

In this study the reactions produced by the vaccine have been consistently mild and of short duration. The local reaction consisted of an area of redness at the site of the injection, and in a few instances slight swelling of the tissues. The most severe systemic reactions observed consisted of mild malaise, headache, and myalgia. Involvement of the axillary lymph nodes was observed in 46 per cent of the cases, headache in 20 per cent, and rise in temperature in 8 per cent. The highest temperature noted was 101°. In many instances, those presenting mild reactions following the intracutaneous injection of the vaccine had a history of relatively severe reactions after subcutaneous injections of the vaccine.

Data are not yet available which would permit the comparison of the immediate or long range immunological response to re-vaccination with one intracutaneous dose of typhoid vaccine with that produced by re-vaccination with three subcutaneous injections at weekly intervals. This phase is being given further study and will be made the subject of a future report.

The duration of immunity following re-vaccination with one intracutaneous injection of 0.1 c.c. of the typhoid vaccine has not been determined, but will be investigated in the future.

SUMMARY

A group of 200 persons who had never been vaccinated were given three subcutaneous injections of 0.5, 1 c.c. and 1 c.c. respectively of the typhoid vaccine. A group of 100 individuals who had received from one to several courses of the typhoid vaccine from 2 to 10 years or more prior to the time this study was made were re-vaccinated with one intracutaneous dose of 0.1 c.c. of typhoid vaccine.

Two weeks after vaccination, the blood sera of those re-vaccinated with a single dose of 0.1 c.c. of the vaccine intracutaneously and of those vaccinated for the first time with three subcutaneous injections of the vaccine protected mice against a virulent strain of *E. typhosa* to approximately the same degree.

The results obtained indicate that the immunological response of the individual to re-vaccination with one dose of 0.1 c.c. of vaccine intracutaneously parallels that following the initial vaccination with three subcutaneous injections of 0.5 c.c., 1 c.c., and 1 c.c. of the vaccine at weekly intervals.

The reactions observed following re-vaccination with 0.1 c.c. of typhoid vaccine are mild as compared with those frequently produced by subcutaneous injection of the vaccine.

CONCLUSIONS

1. Re-vaccination against typhoid fever of previously immunized persons with one intracutaneous dose of 0.1 c.c. of typhoid vaccine produces an immediate immunological response which is comparable to that following original vaccination with three subcutaneous injections of the vaccine.

2. As compared with re-vaccination with three subcutaneous injections of the vaccine, re-vaccination with one small intracutaneous dose of vaccine is a simple and time saving procedure.

3. The reaction following the intracutaneous injection of 0.1 c.c. of typhoid vaccine is relatively mild as compared with that frequently produced by the subcutaneous injection of 0.5 c.c. or 1.0 c.c. of the vaccine.

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The Initiation of Social Medicine

STATISTICS indicate that professional, economic, and social factors influence mortality rates—a fact that has long been recognized, but until recently neglected by the medical profession.

Figures, quoted by Dr. René Sand in a paper presented to the Medical Society of Geneva, show that although mortality rates have been decreasing since the second half of the 19th century, the decrease has been proportional in all the social classes so the difference between the classes has varied little.

Public health and social medicine are becoming an increasingly important part of the medical curricula, as is shown by a survey of such courses in medical schools. Eventually, it is believed, the medical course will be built around the normal person; the first year will be devoted to a study of normal physiology, followed in the succeeding years by courses in public health and by clinical work in which the social aspects of disease will be emphasized. The relationship of the medical profession to social medicine is yet to be established, but if the medical profession has had this training, the solution of the problem will be easier, happier, and quicker, and the individual members of the medical profession will be able to adapt themselves to the new situation more readily. — Dr. René Sand: *Revue Medicale de la Suisse Romande*, 18. 12:761–772 (Oct. 25), 1938.

Serologic Tests in the Diagnosis of Syphilis*

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THE Laboratory Section of the American Public Health Association has been interested for a number of years in the development of standard methods for the complement-fixation test for syphilis. Dr. Gilbert,[1] as referee, directed attention to establishing principles of technic, upon which leading serologists agreed, and which, if followed, might be expected to yield dependable results. So many phases of the technic rested upon a purely empirical basis that more complete information regarding the fundamental relationships that govern the reactions between the different reagents of the test was essential to further progress in standardization. After extended study, it has been possible recently to describe methods which permit a quantitative determination of the reaction and thus provide a rational basis for standardization of the test.[2-4] Accurate measurement of the changes in complement activity that occur under the different conditions of the test depends upon the determination of the amount of complement required in each instance to give 50 per cent hemolysis, as well as upon the fact that constant and directly proportional relationships exist between the increments of complement so required and the increments of serum or antigen used when these reagents are properly standardized and adjusted to give maximum interaction.

The new method was established as a routine procedure in the New York State Laboratory in April, 1937. The series of specimens[5] provided by the U. S. Public Health Service† in its study to evaluate serodiagnostic tests for syphilis afforded an opportunity to study the results obtained in the "control tests" in comparison with those of the quantitative technic and of the method previously employed in New York State, which utilized the same reagents but was not quantitatively standardized.

The titer obtained by the quantitative method is the ratio of the amount of complement required for 50 per cent hemolysis in the presence of serum and antigen to that similarly required with serum alone. It is a numerical index of the activity of the serum. A titer of 1.0 indicates that the reaction of the serum is the same with or without antigen and a reaction of 1.5 indicates such a slight degree of activity that titers of 1 to 1.5 are

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† We are grateful to Dr. R. A. Vonderlehr and Dr. J. F. Mahoney of the United States Public Health Service for making available the complete clinical histories of these cases.

TABLE I

Results of Quantitative Complement-fixation Tests
Federal Series, 1936–37 and 1938

	Titer of Serum												
Type of Case	*1.0*	*1.1*	*1.2*	*1.3*	*1.4*	*1.5*	*1.6–1.9*	*2–3*	*4–6*	*7–10*	*10+*	*Not Tested*	*Total*
Healthy persons	127	46	16	7	1	1	0	0	0	0	0	2	200
Syphilitic cases	30	6	1	7	0	1	10	34	121	54	129	14	407

reported as "no reaction." In general, titers greater than 6 correspond with a degree of reaction previously reported as "4+." In the test for syphilis titers may range from 1 to 500 or greater, but, as a routine procedure, only those up to 10 are differentiated; the higher ones are at present reported as "greater than 10." In the vast majority of cases, the discrepancy between duplicate determinations is less than 25 per cent and is usually less than 8 per cent.

The results obtained with 198 of the non-syphilitic and with 393 of the syphilitic groups that were studied quantitatively are given in Table I.

None of the sera from healthy persons had titers exceeding 1.5; in fact, only one was as high as 1.5. The cases from which the sera of the syphilitic group were obtained consisted mainly of treated cases in which the serologic reaction is frequently the principal evidence of the activity of the disease. One hundred and twenty-nine of the syphilitic sera had titers greater than 10; 54 of 7 to 10; 121 of 4 to 6; 34 of 2 to 3; 10 of 1.6 to 1.9; and 45 of 1.5 or less.

The results obtained with the specimens that were tested both by our previous method [6] and by the quantitative technic are given in Table II and record the variations in the reactivity of the different sera, which the older method of testing and reporting failed to indicate. While the majority of specimens with titers of 7 or greater gave complete fixation in the old form of test, there were 11 exceptions, one of which was a marked discrepancy. Also, with other groups of specimens, which in the quantitative test were shown to have similar degrees of activity, the reports varied. For example, of 55 specimens with titers of 4 to 6, 9 in the older test gave slight or partial reactions (± or +), while 24 gave complete fixation (4+). These discrepancies, occurring as they did in tests made under similar conditions and with the same antigen, were evidently due to the fact that a method not quantitatively standardized fails to provide in every

TABLE II

Comparison of Results of Quantitative Tests with Those of the Method Previously Employed
Federal Series, 1936–37

	Titer of Syphilitic Sera in Quantitative Test							
Previous Method	*10+*	*7–10*	*4–6*	*2–3*	*1.6–1.9*	*1.5 or Less*	*Not Tested*	*Total*
4+	60	27	24	1	0	0	8	120
3+	6	2	9	0	0	0	0	17
2+	1	1	13	2	0	0	0	17
+	0	1	8	9	0	0	0	18
±	0	0	1	7	1	0	0	9
—	0	0	0	0	4	12	0	16
Unsatisfactory	0	0	0	0	2	0	1	3
Total	67	31	55	19	7	12	9	200

TABLE III

Comparison of Titers in Quantitative Tests of Specimens from Cases of Syphilis with the Reactions Reported by Other Methods

	Titer in Quantitative Test (1936–37 Federal Series)																							
	10+ (67 Cases)				7–10 (31 Cases)				4–6 (55 Cases)				2–3 (19 Cases)				1.6–1.9 (7 Cases)				1.5 or Less (12 Cases)			
Method	*P*	*D*	*N*	*U*	*P*	*D*	*N*	*U*	*P*	*D*	*N*	*U*	*P*	*D*	*N*	*U*	*P*	*D*	*N*	*U*	*P*	*D*	*N*	*U*
Complement-fixation																								
New York State—previous method	67	0	0	0	30	1*	0	0	46	9	0	0	3	16	0	0	0	1	4	2	0	0	12	0
Kolmer	64	0	0	3	28	0	0	3	48	0	3	4	14	0	5	0	2	0	4	1	3°	0	9	0
Precipitation																								
Kahn Standard	66	0	0	1	29	0	1*	1	47	3	5	0	9	1	6	3	3	0	3	1	1°	0	11	0
Kahn Presumptive	66	0	0	1	30	0	0	1	52	0	3	0	13	1	2	3	4	1	1	1	4°	1	7	0
Kline Diagnostic	63	4*	0	0	30	0	1*	0	52	3	0	0	10	7	1	1	2	2	3	0	2°	2	8	0
Kline Exclusion	67	0	0	0	31	0	0	0	55	0	0	0	17	1	0	1	6	1	0	0	7°	3	2	0
Hinton	66	0	0	1	30	1*	0	0	51	0	2	2	17	0	1	1	6	0	1	0	3°	3	6	0

P = Positive D = Doubtful
N = Negative U = Specimen not tested, anticomplementary, or unsatisfactory due to hemolysis, breakage, leakage, or other causes.
* The reactions and clinical histories of these cases are listed at the end of this report.
° The reactions and clinical histories of these cases are listed at the end of this report.

instance conditions for maximum reaction and grades reactions in such a way that the reports have a quantitative connotation which is not always reliable. Fewer marked discrepancies in reports, however, were observed with the old test than with the methods of the "control" laboratories as shown in Tables III and IV which summarize their results in comparison with those of the old and new methods of New York State. Discussion will be limited to those reports that must be considered widely discrepant; namely, the "doubtful" or "negative" reports on specimens with titers of 7 or greater, and the "positive" reports on specimens with titers of less than 2, since these are so striking as to wrarant consideration in some detail.

TABLE IV

Comparison of Titers in Quantitative Tests of Specimens from Cases of Syphilis with the Reactions Reported by Other Methods

	Titer in Quantitative Test (1938 Federal Series)																							
	10+ (62 Cases)				7–10 (23 Cases)				4–6 (66 Cases)				2–3 (15 Cases)				1.6–1.9 (3 Cases)				1.5 or Less (33 Cases)			
Method	*P*	*D*	*N*	*U*	*P*	*D*	*N*	*U*	*P*	*D*	*N*	*U*	*P*	*D*	*N*	*U*	*P*	*D*	*N*	*U*	*P*	*D*	*N*	*U*
Complement-fixation																								
Kolmer	62	0	0	0	23	0	0	0	63	0	3	0	13	0	2	0	0	0	3	0	1°	1	31	0
Eagle	60	0	1*	1	23	0	0	0	57	4	5	0	9	3	3	0	0	1	2	0	0	1	32	0
Precipitation																								
Kahn Standard	61	0	1*	0	22	0	0	1	52	7	7	0	9	1	5	0	1	0	2	0	0	1	32	0
Kahn Presumptive	61	0	1*	0	22	0	0	1	63	0	3	0	11	0	4	0	2	0	1	0	3°	0	30	0
Kline Diagnostic	61	0	1*	0	22	0	0	1	56	8	2	0	9	2	4	0	1	0	1	1	0	3	29	1
Kline Exclusion	62	0	0	0	22	0	0	1	66	0	0	0	13	2	0	0	2	0	0	1	3°	8	21	1
Hinton	59	0	1*	2	22	0	0	1	61	0	2	3	14	0	0	1	3	0	0	0	5°	3	24	1
Eagle Macro	59	1*	1*	1	22	1*	0	0	52	3	8	3	8	2	3	2	2	0	1	0	0	0	32	1
Eagle Micro	60	0	1*	1	23	0	0	0	58	1	4	3	11	1	1	2	2	0	1	0	1°	3	28	1

P = Positive D = Doubtful
N = Negative U = Specimen not tested, anticomplementary, or unsatisfactory due to hemolysis, breakage, leakage, or other causes.
* The reactions and clinical histories of these cases are listed at the end of this report.
° The reactions and clinical histories of these cases are listed at the end of this report.

The majority of specimens with titers of 7 or greater were reported as "positive" by all methods. However, "negative" reports were made on 6 and "doubtful" reports on 8 of these specimens. A description of the 14 cases is given at the end of this report. The serologic and clinical findings in 5 of these are reviewed briefly for purposes of illustration:

Case 273 F—Untreated tabes-paresis; titer greater than 10; all serologic reports positive except that of the Kline diagnostic precipitation test, which was doubtful.

Case 167 G—Syphilis of the central nervous system; no treatment; titer greater than 10; all serologic reports positive except those of the Kahn precipitation and the Eagle flocculation tests, which were negative.

Case 96 F—Latent; treated with two doses each of arsphenamine and bismuth; titer greater than 10; all reports positive except that of the Kline diagnostic test, which was negative.

Case 8 G—Cardiovascular; no treatment; titer over 500; all serologic reports positive except that of the Hinton precipitation test, which was negative. It is of interest that the Kolmer test was only moderately positive in this case which, of all those examined, had the highest titer in the quantitative test.

Case 70 G—Syphilis of the central nervous system with history of "4+" spinal fluid; untreated; titer greater than 10; all reports positive except that of the Eagle complement-fixation test, which was negative.

The clinical histories, as well as the results of the serologic tests, strongly suggest that the doubtful or negative reports made in these cases were attributable to faults in standardization which resulted in prozone effects.

Similar discrepancies occurred in reports of tests with specimens that had titers between 2 and 6 but, as mentioned above, these are not discussed since the conditions underlying the variations in each instance are not so apparent as in the case of the discrepancies of greater degree.

Titers of less than 2 represent such low degrees of reaction that the significance of each can be interpreted only in the light of the clinical signs and history of the individual. Fifty-five specimens fall in this category. Forty-five had titers of 1.5 or less; 21 of these were negative in all tests and only one, No. 244 F, reacted to some degree in all. The cases in which the reports made by different methods were widely discrepant are listed at the end of this report. A review of the serologic and clinical findings in a few of them serves to illustrate the type of discrepancy that occurred.

Case 261 F—Symptomless; treated from May, 1934, to December, 1936: 14 doses neoarsphenamine, 16 bismarsen, and 61 bismuth intramuscularly; last treatment about one month ago; titer 1.3; all reports negative except those of both the diagnostic and exclusion precipitation tests of Kline, which were positive.

Case 277 G—Primary; between March, 1934, and February, 1938, the patient received 19 doses of arsphenamine and 27 of bismuth; titer 1.0; all tests negative except that of Kolmer, which was positive.

Case 256 F—Tertiary; although no treatment had been given, the reaction was negative in all except the Kahn presumptive and the Kline exclusion tests, which were positive.

Case 289 G—Primary; between August, 1927, and February, 1938, the patient received 62 doses of arsphenamine, 60 of bismuth, and mercury and potassium iodide for 12 months; titer 1.0; all reports negative except that of Hinton, which was positive, and that of the Kline exclusion test, which was doubtful.

In all, positive reports were made by at least one method with 18 different specimens in the group with titers of 1.5 or less. While in certain instances further information would be needed to determine to what extent the reports were discrepant, the general character of the clinical and serologic findings of the cases in this group was quite different from that of the discrepant cases in the group with titers of 7 or greater; clinically they were in large part well treated and the majority of the serologic reports were negative. Thus the findings, as a whole, suggested that any activity present was probably slight in

degree. Yet the "positive" reports made in such cases have the same connotation as those with sera of high degrees of specific activity when both are simply recorded as "positive" and, it would seem, would confuse and mislead the physician and certainly fail to give him complete information.

In occasional cases of syphilis, reactions may occur in certain tests and not in others, and the clinical signs or history may indicate less clearly than in the examples cited the nature of the discrepancies, so that the question arises whether the particular antigen is responsible for the reaction that occurs. In the tests for syphilis, the antigens that are used are very similar in nature so that when they are adequately standardized they might be expected to react in a uniform manner. The quantitative technic should be of particular value in the further study of such cases since it provides a means of determining readily the relative value of different antigens and thus affords a serologic control of different technics of complement-fixation or precipitation that has previously been lacking.

SUMMARY

In closing, it is important to stress several points which stand out clearly from a consideration of the comparisons made in this report. The consensus of the serologic results corresponded with those of the quantitative titration and with the clinical findings. The occasional doubtful and negative reports, however, which were made by the different methods with specimens of high titer in the quantitative test, suggest faults in standardization that result in prozone effects. Further, the practice of limiting reports to "positive," "doubtful," or "negative" not only does not serve the clinician adequately, but unfortunately, also fosters the trend for serologists to oversensitize the technic and to report as "positive" the results with sera of relatively slight or doubtful activity. Positive reports with such sera cannot have the same significance as with those of marked activity. Certainly, methods of reporting which fail to distinguish them are misleading to the physician. Finally, reports of "positive," "doubtful," or "negative" connote a laboratory diagnosis whereas the clinician has full responsibility and, with complete information, he, not the laboratory, should make the diagnosis.

It is believed that a quantitative evaluation of the specific activity of a serum which the new method of complement-fixation affords, provides a reliable basis for the standardization of serologic tests and should prove, with clinical experience, an essential guide to the more effective treatment and control of syphilis.

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RECORD OF CLINICAL AND SEROLOGIC FINDINGS IN CASES WITH TITERS OF 7 OR GREATER WHICH GAVE DOUBTFUL OR NEGATIVE REACTIONS IN ONE OR ANOTHER OF THE DIFFERENT TESTS

Case 8 G
Age 50; male, colored
Diagnosis: tertiary cardiovascular
Treatment: none
Temperature: 98; last meal 3 hrs. 10 min.
Titer: 565; all reports positive except that of the Hinton precipitation test which was negative.

Case 70 G
Age 37; male, colored
Diagnosis: C.N.S. lues; Bl. Kahn +; Sp. Wass. 4+
Treatment: none
Temperature: 98.6; last meal 3 hrs. 30 min.
Titer 16.7; all reports positive except that of the Eagle complement-fixation test which was negative

Case 24 G
Age 43; male, colored
Diagnosis: C.N.S. lues, taboparesis; Sp. Wass. ++++
Treatment: none
Temperature: 98.6; last meal 1 hr. 30 min.
Titer: 14.2; all reports positive except that of the Eagle macroflocculation test which was doubtful

Case 304 G
Age 36; male, white
Diagnosis: Syphilis—recurrent secondary C.N.S. involvement
Treatment: 3 ars. / 3 bi. } 2.8.38 — 2.18.38
Temperature: 98.4; last meal 4 hrs.
Titer: 11.2; all reports positive except that of the Kline diagnostic test which was negative

Case 167 G
Age 55; male, white
Diagnosis: tertiary C.N.S. lues; Bl. Kahn 4+
Treatment: none
Temperature: 98.6; last meal 4 hrs.
Titer: 10+; all reports positive except those of the Kahn precipitation and the Eagle flocculation tests which were negative

Case 96 F
Age 33; male, black
Diagnosis: syphilis—latent, treated
Treatment: 1.21.37 and 1.25.37=arsphenamine 0.3 gm (v) × 2; bismuth salicylate 0.15 gm (m) × 2
Temperature: 99; last meal 6 hrs. 30 min.
Titer: 10+; all reports positive except that of the Kline diagnostic test which was negative

Case 127 F
Age 28; male, colored
Diagnosis: secondary—generalized small papular syphilide
Treatment: 2 injections neo; 2 injections bis.; Wass. and Kahn 4+
Temperature: 98.2; last meal 2 hrs.
Titer: 10+; all reports positive except that of the Kline diagnostic test which was doubtful

Case 252 F
Age 66; male, white
Diagnosis: cardiovascular—tertiary lues
Treatment: Hg. rub 6x/wk since 1.7.31
KI gr x T I D since 1.7.31
Temperature: 98.6; last meal 1 hr.
Titer: 10+; all reports positive except that of the Kline diagnostic test which was doubtful

Case 273 F
Age 25; male, white
Diagnosis: tabes paresis
Treatment: none
Temperature: 98.6; last meal 2 hrs.
Titer: 10+; all reports positive except that of the Kline diagnostic test which was doubtful

Case 286 F
Age 53; male, white
Diagnosis: tertiary lues with cardiovascular changes
Treatment: none
Temperature: 98; last meal 4 hrs.
Titer: 10+; all reports positive except that of the Kline diagnostic which was doubtful

Case 18 G
Age 68; male, white
Diagnosis: tertiary C N S lues, 40 years duration
Treatment: none
Temperature: 98.6; last meal 2 hrs.
Titer 7.3; all reports positive except that of the Eagle macroflocculation test which was doubtful

Case 18 F
Age 38; male, colored
Diagnosis: latent
Treatment: (1) in 1924 received approximately 5 intravenous and 17 intramuscular injections
(2) since 11.25.35 to 11.16.36 has re-

ceived 25 injections of bismuth salicylate 0.15 gms.(m); also 2 mos. of Hg. rubs and KI gtts 15 T I D
Temperature: 98.8; last meal 1 hr. 30 min.; 1½ oz. whiskey prior to collection of specimen
Titer: 7.3; all reports positive except that of the Kahn standard test which was negative

Case 62 F
Age 25; female, white
Diagnosis: latent, treated
Treatment: 11.16.34 to 1.8.37 = 21 injections arsphenamine 0.3 gm (v); 26 injections bismuth salicylate 0.15 gm (m); 4 mos. of mercury rubs (HS) & KI gtt X T I D
Temperature: 99; last meal 6 hrs.
Titer: 7; all reports positive except that of the Hinton test which was doubtful.

Case 75 F
Age 26; male, white
Diagnosis: congenital, treated
Treatment: (1) in 1927 received 4 injections arsphenamine 0.4 gm (v)
(2) 12.2.35 to 1.11.37=30 injections arsphenamine 0.3 gm (v) and 30 injections bismuth salicylate 0.15 gm (m); 6 mos. Hg. rubs and KI gtts 15 T I D
Temperature: 99; last meal 2 hrs. 20 min.
Titer: 6.7; all reports positive except that of the New York State test which was doubtful, and the Kolmer test for which no specimen was received

Record of Clinical and Serologic Findings in the Cases With Titers of 1.5 or Less in Which Positive Reports Were Made With One or Another of the Different Tests

Case 2 F
Age 23; male, colored
Diagnosis: asymptomatic
Treatment: (1) Jan. 1936=4 to 6 arm injections
(2) 7.4.36 to 9.23.36=3.7 gms. arsphenamine in 15 injections
(3) 9.23.36 to 11.5.36 KI gtts. 10 T I D and mercury rubs at bedtime
Temperature: 98.4; last meal 2 hrs. 10 min.
Titer: 1.3; all reports negative except that of the Hinton test which was positive and those of the Kahn presumptive and Kline exclusion tests which were doubtful

Case 261 F
Age 32; male, white
Diagnosis: symptomless; Wass. 4 plus Feb. 9 and 13, 1934; Kahn 3 plus and neg. Wass. on 5.16.34—all others including spinal serology have been neg. except for state lab. report of Kahn 2 plus and neg. Wass. on 3.5.36
Treatment: From 5.6.34 to 1.13.37 has had 14 neo., 16 Bismarsen and 61 bismuth intramusc. Last Rx about 1 month ago
Temperature: normal; last meal 3 hrs.
Titer: 1.3; all reports negative except those of the Kline exclusion and Kline diagnostic tests which were positive

Case 308 G
Age 25; female, colored
Diagnosis: secondary
Treatment: 3.9.37 to 2.21.38—15 Bi and 3 ars.
Temperature: 98.6; last meal 1 hr. 30 min.; 2 oz whiskey prior to collection of specimen; 2d day of menstruation
Titer: 1.3; all reports negative except those of the Kline exclusion test which was doubtful and the Hinton test which was positive

Case 13 F
Age 19; male, colored
Diagnosis: asymptomatic
Treatment: 8.13.36 to 11.11.36= (1) 4 injections arsphenamine 0.3 gm (v); (2) 7 injections bismuth salicylate 0.15 gm (m)
Temperature: 98.6; last meal 1 hr. 30 min.
Titer: 1.1; all reports negative except those of the Kahn presumptive, the Kline exclusion, and the Hinton tests which were positive

Case 243 F
Age 28; male, white
Diagnosis: latent LI in May 1935
Treatment: 5.31.35 to 5.11.36 Neo 21 injections; 5.31.35 to 8.23.35 Hg. sol. 12 injections; 5.5.35 to 1.6.37 34 injections
Temperature: 98.6; last meal 3 hrs.; 4 beers prior to collection of specimen
Titer: 1.1; all reports negative except Kline exclusion which was positive and the Kline diagnostic and Hinton which were doubtful

Case 68 G
Age 22; male, white
Diagnosis: tertiary latent; Bl. Kahn 4+
Treatment: Neo and Bi q. week past 4 mos.
Temperature: 98.6; last meal 2 hrs.
Titer: 1.1; all reports negative except those of the Kahn presumptive, and Kline exclusion tests which were positive, and the Kline diagnostic and Eagle microflocculation tests which were doubtful

Case 64 F
Age 52; male, white
Diagnosis: latent, treated
Treatment: 3.17.36 to 1.4.37=14 bismuth salicylate 0.15 gm (m) and 6 bis. sod. tartrate 2 cc. (m); had 10 intramuscular injections from family doctor in June and July 1936
Temperature: 99; last meal 2 hrs. 45 min.
Titer: 1.0; all reports negative except that of the Kline exclusion test which was positive

Case 67 F
Age 59; female, white
Diagnosis: latent, treated
Treatment: 1.31.20 to 1.18.37 arsphenamine 0.4 gm (v) x 13; 9 mos. Hg. rubs and KI gtt 15 T I D; bismuth salicylate 0.15 gm x 35; neoarsphanamine 0.2 gm (v) x 2; several spinal drainages
Temperature: 99; last meal 4 hrs.
Titer: 1.0; all reports negative except that of Kolmer which was positivc, and those of the Kline exclusion test and the Hinton test which were doubtful

Case 70 F
Age 44; male, colored
Diagnosis: latent, treated
Treatment: 1930=8 arm injections by local doctor; 1.28.31 to 11.18.36=bismuth salicylate 0.15 gm (m) x 104; 20 months of Hg rubs and Potassium Iodide gtt 15 T I D
Temperature: 98.4; last meal 10 hrs.
Titer: 1.0; all reports negative except that of the Kline exclusion test which was doubtful and that of the Hinton which was positive

Case 244 F
Age 60; male, white
Diagnosis: tertiary lues (hepatic); patient showed no signs of syphilis beyond a strictly positive blood test; spinal fluid findings negative; died February 3, 1937 of cirrhosis of the liver; no autopsy
Treatment: antiluetic treatment many years ago
Temperature: 98; last meal 4 hrs. 30 min.
Titer: 1.0; New York State report was negative; Hinton report was doubtful; all others positive

Case 256 F
Age 33; female, black
Diagnosis: tertiary
Treatment: none
Temperature: 99.8; last meal 2 hrs.
Titer: 1.0; all reports negative except those of the Kline exclusion and the Kahn presumptive which were positive

Case 59 G
Age 50; male, colored
Diagnosis: now has latent lues; infected in 1935; 4+ Wass.
Treatment: in 1936 26, in hip, Bi; 26 neo in arm
Temperature: 98.6; last meal 2 hrs.
Titer: 1.0; all reports negative except those of Kahn presumptive and Kline exclusion and Hinton which were positive, and Kline diagnostic and Eagle microflocculation which were doubtful

Case 69 G
Age 26; male, white
Diagnosis: tertiary latent; Blood Kahn 4+
Treatment: none
Temperature: 98.6; last meal 2 hrs. 30 min.
Titer: 1.0; all reports negative except those of the Kahn presumptive and Kline exclusion which were positive, and the Kahn standard and the Kline diagnostic which were doubtful

Case 277 G
Age 42; male, white
Diagnosis: primary, treated
Treatment: 3.21.24 to 2.11.38 received 19 ars. and 27 bi.
Temperature: 100.2; last meal 1 hr. 40 min.
Titer: 1.0; all reports negative except that of Kolmer which was positive

Case 289 G
Age 25; female, white
Diagnosis: primary
Treatment: 8.7.27 to 2.16.38 received 62 ars., 60 bi., and 12 mos. Hg. and Ki inoculations
Temperature: 99; last meal 8 hrs.
Titer: 1.0; all reports negative except that of the Kline exclusion test which was doubtful and the Hinton test which was positive

Case 300 G
Age 49; male, colored
Diagnosis: primary
Treatment: 1924 to 2.18.38, 18 ars., 10 Bi., and 2 mos. Hg and Ki
Temperature: 98.6; last meal 6 hrs.
Titer: 1.0; all reports negative except the Eagle complement-fixation test which was doubtful and the Hinton test and the Eagle microflocculation test which were positive

Case 311 G
Age 20; female, colored
Diagnosis: ? primary
Treatment: 10.30.35 to 2.21.38—41 ars., 41 Bi., and 6 mos. Ki+Hg

Temperature: 98.4; last meal 2 hrs. 45 min.; 2d day of menstruation
Titer: 1.0; all reports negative except that of the Kline exclusion test which was doubtful and the Hinton test which was positive

Case 121 F

Age 19; male, colored
Diagnosis: primary chancre without secondaries in which treatment had been instituted on 3rd day of lesion, at clinic; Bl. Wass. 2+
Treatment: 6 intravenous neo before admittance to hospital with ischio rectal abscess and primary lesion involuting; 3 I.V. neo and 3 intramuscular bismuth since entry
Temperature: 98.6; last meal 4 hrs.
Titer: 0.9; all reports negative except Kahn presumptive and Kline exclusion which were positive and Kline diagnostic which was doubtful

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Do We Save Life?

MY point is obvious: If we save a man from death by tuberculosis we save him for death by something else. We may postpone death but what we really save is health. That is eminently worth saving whether life be prolonged or no. Indeed the mere prolongation of life without the conservation of health may well become a disaster, social no less than personal.

. . . It is estimated[1] that by 1975 the population 20 to 44 years of age will have increased by only 6 per cent but the population 45 to 64 years of age will have increased by 69 per cent. Unless the generation now in high schools and colleges can be delivered from the invalidisms of middle age they will become an intolerable burden upon their offspring.—J. Rosslyn Earp, *New York State J. Med.*, Dec. 15, 1938, p. 1560.

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Nursing Service of the State Health Department*

As Seen by the Private Agency

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THE general aim of the nursing service of the state health department is to assist in the promotion of the health of all the citizens of the state. It accomplishes this aim chiefly by helping each locality to provide and maintain proper local nursing services of good standard. We see, then, the state health department nursing service as a standard making and promoting force, interested in both public and private agencies and concerned with maternity service, control of communicable disease, the care of the sick, and the health supervision of the well.

If the state nursing service is to fulfil its large responsibility toward local services, it needs to be part of a modern well set up state health department; to serve all of the bureaus of the department, and to be on terms of good relationship with each of them. Moreover, it needs qualified leadership, sufficient nursing personnel, and an adequate budget, in order to have an adequate program.

Such a state nursing service profits by close association with all other statewide forces working for health—professional organizations covering such fields as medicine, nursing, education, home economics, and social work; and lay groups, especially those with formulated health programs.

We can also see the state nursing service as an essential link in the chain between local and national health services. The national agencies help to set standards, to develop principles of action, to make studies, and to outline programs. These are all done in the hope that they will extend and improve local health services, but the jump from a national to a local service is often too great. Increasingly, the state health departments are looked upon as the intermediary.

This brings us to a wish made by Katherine Tucker in 1932, "to have in each state department of health an adequate budget for a state public health nursing service which would provide for a well qualified personnel in sufficient numbers to carry on a public health nursing service requisite for each state."[1]

* Read before the Public Health Nursing Section of the American Public Health Association at the Sixty-seventh Annual Meeting in Kansas City, Mo., October 26, 1938.

That wish is gradually being answered as a comparison of the situation in 1931 with that in 1937–1938 shows:

Table I

The Type of Public Health Nursing Organization in State and Territorial Health Departments in 1931 and 1937 [2]

Type of Organization	*1931*	*1937*	*1938*
Separate bureau or division	9	21	26
Unit under central administration	2	7	6
Unit under local health work	3	5	5
Unit under division of maternal and child health	24	18	14
Total states and territories providing a public health nursing consultant service	38	51	51

Further progress is noted by a comparison of the 1931 report, "Public Health Nursing in State Health Departments" made by the National Organization for Public Health Nursing, with a report made in 1935 by a joint committee of the American Public Health Association and the National Organization for Public Health Nursing. In the foreword to the 1931 report Sophie Nelson says, "The material indicates that the practice is so variable that it is not possible to draw any conclusions which might lead to formulation of principles." [3] The later study made in 1935 went a long way in developing a carefully prepared statement of the functions of nursing service in state health departments and tentative suggestions for performing these functions.[4]

Inasmuch as we have this excellent statement of functions and methods plus the many suggestions put forth by Miss Tucker and Miss Nelson in the papers already referred to, we are laying the emphasis in this paper on what the private agencies want of the state health departments, and how the states can or would like to fill these needs. Our paper is based on inquiries sent to 10 visiting nurse associations of varying sizes and widely distributed geographically. We also wrote 4 state health departments, the U. S. Public Health Service, and the U. S. Children's Bureau. Interest in the subject is reflected by the fact that we received replies from 100 per cent of our inquiries.

What does the private public health nursing agency expect, hope for, and need from the nursing service of the state health department? Moral support! The director of a large eastern city agency says, "Because our state health department concentrates its services more in the rural areas it is difficult to know how the large private city agency should use it. However, it gives us a feeling of stability to know there is a good state health department behind us that will set the standards for all health work in the state."

Liaison agent! Another large city agency looks to the public health nursing division of the state health department to provide connection with nurses out in the state, if the agency wishes to take up any matter in an individual county.

"We use the state nursing staff of specialists in our program of staff education" says another large city service in the middle west. "We consult the Division of Public Health Nursing regarding possible applicants for vacancies on our staff and seek stipends for staff nurses who prefer to work in the rural field."

The smaller nursing service hopes for all the services that her big city sister wants and more! "We believe," says the director of a comparatively small agency in the deep south, "that another very helpful project would be a good

circulating library. This, of course, would consist of the current new professional books and should be kept right up to date."

"Naturally we small organizations cannot afford a maternity, tuberculosis, or mental hygiene supervisor," states a philosophic visiting nurse association director from the state where the tall corn grows. "It seems to me there is a chance for much help in staff preparation through the use of the special supervisors in the health department."

From the far Northwest where private agencies are few and far between, a small visiting nurse association uses the state health department "for help in devising better methods of working with and through lay committees."

Private public health nursing agencies, large and small, from east, west, north and south and in between, look to the state health department to set standards and furnish support in maintaining them. They seek help in improving their service through the state's leadership and participation in staff education programs. They want help in keeping up to date in special fields through consultant service available from the state health department. They look upon the state health department as an agency which can collect information, new ideas and accounts of interesting experiments, and distribute them through bulletins, libraries, institutes, speakers, literature, correspondence, and other means. They use this state-wide agency for a place to find nurses for jobs and jobs for nurses. They seek, in return for providing a practise field for new nurses, stipends for scholarships for their own staff nurses. One director of a large visiting nurse association on the Pacific Coast summarizes the ways in which the state health department could provide better service to the private agency as follows:

1. Assuming responsibility for placement of public health nurses in the state, both in private and public agencies
2. Being ready to act in an advisory capacity to private agencies as well as public
3. Keeping communities informed as to trends in public health nursing and its administration
4. Sponsoring educational programs, institutes, and conferences in urban as well as rural areas

This is a big order for any agency. Can the state health department meet these demands?

The Division of Public Health Nursing in the State Bureau of Health in Maine states that all nurses in private agencies are included in the staff education institutes and are given the opportunity to participate in the discussions and in taking definite part in the program. "We would like to see better coöperation between the local private and official agencies themselves, and better reporting to the State Health Department of work accomplished."

"We have a lending library from which all nurses can borrow," reports the Chief of the Bureau of Public Health Nursing in Indiana. "Our *Public Health Nursing Manual* is available for all nurses who request it. All news bulletins of any kind go to all the public health nurses in the state. Nurses employed by private agencies are eligible for fellowships for further training in public health nursing which we have available through Social Security Funds. . . . We would like the private agencies to remember that the nurses in the State Health Department need the stimulation that the agency's consultants can give us through visits at our office, conferences in the field, and permission for our staff to visit their agency to gather new ideas. Don't forget that private agencies were the first to develop public health nursing services both locally and in state health departments." They also furnish most of the opportunities for student practice and observation.

"As you are probably aware," writes the Director of the State Division of Public Health Nursing in Oregon, "we have only one private agency in the State of Oregon giving nursing service. To that association we supply credentials of qualified nurse applicants and give advisory service concerning problems of organization and administration as needed. We hope the nurses on the staff feel they may participate more actively in our educational program and make wider use of our consultant service and library facilities."

New York State offers "an arbitration service for both official and nonofficial agencies with thought for the integrity of the nonofficial agency when certain critical situations or opportunities arise as, for instance, discouraging employment of nurses by welfare authorities when service for indigent persons could be bought from existing visiting nurse associations."

There is precedent and experience to prove both that private agencies have not looked and will not look in vain to the nursing services of state departments of health for the services they need and that the state health departments not only appreciate the rôle of the private agency in trying out and perfecting new ideas and in providing practise fields and experience for nurses needed so badly in rural areas, but also that they take very seriously their obligation to all agencies which are contributing to the public health program.

These statements would indicate that the staff of the state nursing services must act as counsellors, teachers, judges, vocational and placement secretaries, and leaders in public health nursing—in other words, they must be the best nurses in the country. Both private and official agencies have a responsibility for demanding the type of machinery that will assure the careful selection of personnel and provide suitable administration and security in the job so they may contribute to their fullest extent.

Marion Sheahan, Director, Division of Public Health Nursing, State Department of Health in New York, writes:

> A nonofficial agency thinking of the total health of the community is limiting its usefulness if it does not understand and influence the appointments of personnel capable of providing leadership for a whole program, working out the part of the whole program to which a nonofficial agency can best contribute and then continuing to influence the conduct of the program so there is an integrated community service. I believe this might even extend to the initiation of a nonofficial agency by the official agency leader where one is indicated but does not exist.

Pearl McIver, Senior Public Health Nursing Consultant of the U. S. Public Health Service, writes:

> You will remember that I have believed for some time that the plan of organization in a state health department was not so essential as the attitude toward nursing of the commissioner and other division directors. However, our experience from the past few years has led me to believe that nursing should be organized as a separate bureau on a par with all other activities of the state health department. This does not mean that it would function as a separate entity. To be successful, it must be very closely correlated with the work of all other divisions. It naturally follows that there should be a strong person in charge of local health activities who will be the coördinator for the work of all divisions which have to do with local health services. This would include nursing, sanitation, child hygiene, tuberculosis control, syphilis control, dental hygiene, etc.

This statement ties in with the recommendation made in "Nursing in State Health Departments"[4]:

> To coördinate service of all public health nursing in the department of health, a unit of nursing headed by a well qualified public health nurse, is necessary. The conclusion that a unit is needed has already been reached by the Inter-departmental Committee for Coördinating Health and Welfare Activities of the federal government.

Naomi Deutsch, Director, Public Health Nursing of the Children's Bureau, suggests another item for our discussion:

What provision for coöperation with professional groups of nurses is there in the health department, such as representation on board of health, representation on advisory committee or through an advisory committee on public health nursing.

This has reference to

. . . representation from public health nursing groups on advisory committees to the state health departments, such as the general advisory committee to the department and advisory committees to separate divisions, particularly those of maternal and child health, public health nursing, services to crippled children, etc. Such types of representation are being more and more encouraged and are quite prevalent in the maternal and child health services and services to crippled children.

It would seem then, that if the state nursing service is to be in a position to help the private agencies, a unit of public health nursing under qualified nursing direction is an essential. Also some plan for public health nursing representation on advisory committees makes for smooth coöperation. It is interesting to note that both of these essentials have been recommended by the National Organization for Public Health Nursing as far back as 1926.

We would like to suggest that the nursing staff of the state health departments develop a definite plan for visiting the private agencies, to review with them questions of organization, administration, staff education and program, both in terms of content and of the extent to which the program reaches into the community. And why not reverse the procedure by suggesting that the directors of the private agencies make a practice of visiting the state health department office once a year, or once every other year? Is it not important for us to see the set-up and review the program on the ground?

Let us pause here to speak in more detail of staff education. Is there any better way of developing a community viewpoint among local nurses than to bring together into a joint staff meeting the members of the local public and private agency staffs? Should not each know the program, technics and teachings of the other? and should not the effectiveness of both services in qualitative and quantitative terms be studied jointly? It would seem that the state health department nurses were the logical instruments to bring this about.

Effective team work between private local agencies and the state nursing services depends on two factors. The first is that the state accepts the responsibility of helping the private agencies and is equipped to do so. The second is that the private agencies recognize the state nursing service as in a position of leadership, and request consultation and advice from it. Undoubtedly the states which are making greatest progress are those in which the public and private agencies, both local and state, have learned to play the game together. May their tribe increase!

In conclusion, let us look at the national picture. Since the passage of the Social Security Act, we have been tremendously strengthened by consultant public health nursing services in two governmental agencies, the U. S. Public Health Service and the Children's Bureau, each with 5 regional consultant nurses under excellent leadership from Washington. In addition, several private national groups are in the public health nursing picture. Among them are:

National Organization for Public Health Nursing
American Red Cross
National Society for the Prevention of Blindness
American Social Hygiene Association
Maternity Center Association
John Hancock Mutual Life Insurance Company
Metropolitan Life Insurance Company

Each of these provides nurses who visit the states and many of them visit local services within the states.

It would seem that the objective of each would best be reached if the work were carried on as much as possible through the state nursing services. Up to now, the opportunity for this has been limited by the limitations of the states themselves. Increasingly, we hope the state nursing services will be kept better informed of the programs and methods of each national group. This can be brought about in part by more frequent individual conferences between the representatives of national agencies and the state nursing staffs. One practical device is the sending of itineraries of national representatives to the states.

This question of the desirable interplay between private agencies and state nursing services presents many problems of relationships—local to local, local to state, state to national, and then the whole series in reverse order. This brings new emphasis to our need for and dependence on one national agency equally interested in us all—the N.O.P.H.N. Anew we realize that the National Organization for Public Health Nursing is a clearing house. Through it, we may all clear our ideas, our successes and failures; and from it, we get guiding principles and generally accepted practices which we in turn adapt to fit the needs of the locality or state.

In a general sense, the N.O.P.H.N. may be thought of as the operating part of the Public Health Nursing Section of the American Public Health Association. Through the Section we have the opportunity of participating in all other branches of public health work and of learning how to integrate our part with the whole. Through the N.O.P.H.N. we try to put public health nursing into successful operation.

We are in a period of great stimulation of public health nursing. There are new emphases, new methods, and new funds. Public and private agencies are both necessary, and upon their ability to play the game together will the aim of better health for all the people be reached.

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Studies on Trichinosis*

XI. The Epidemiology of *Trichinella spiralis* Infestation and Measures Indicated for the Control of Trichinosis

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TWO years ago we inaugurated in the National Institute of Health a basic study designed to determine the extent of the trichinosis problem in the United States and to provide information which might aid in outlining a working program for the control of this disease. This study is based on the examination for trichinae of diaphragm material from cases coming to necropsy in hospitals, the cases representing routine hospitalizations unassociated with either clinical or anatomical diagnoses of trichinosis. Each diaphragm included in this study has been examined by two different methods, the direct microscopic method and the digestion-Baermann method, both of which have been described in detail by Hall and Collins [1] and by Nolan and Bozicevich.[2]

At this writing there has been examined a total of 3,000 diaphragms divided into several different series according to the origin of the material. These various series are, as follows:

1. A base series comprising diaphragms received from 10 hospitals in Washington, D. C., 2 U. S. Marine Hospitals, and 4 U. S. Naval Hospitals on the east coast.

2. A random series comprising diaphragms received from 51 hospitals in 19 states, the hospitals being selected purely at random and the diaphragms representing random samplings of cases coming to necropsy in these hospitals.

3. A so-called "negative" series comprising diaphragms from certain hospitals in states in which no cases of clinical trichinosis had ever been reported.

4. A traumatic series comprising diaphragms from persons meeting traumatic death and not hospitalized, designed to negate the criticism that a previous trichina infestation may have influenced the hospitalization of some of the cases represented in the other series.

5. A Jewish series comprising diaphragms from orthodox and unorthodox Jews, designed to ascertain the value of the Mosaic Code in preventing trichinosis under complex modern conditions.

Table I presents the results of the examination of diaphragms in the various series.

The basic series comprising over 2,100 diaphragms at this writing shows a trichina incidence of 16.8 per cent, and the random and negative series show incidences of 18.3 and 18.6 per cent, respectively, figures which are within 2 standard deviations of findings in the base series. The traumatic series, with yet a relatively small num-

* Read before the Laboratory Section of the American Public Health Association at the Sixty-seventh Annual Meeting in Kansas City, Mo., October 26, 1938.

TABLE I

Results of Examination of 3,000 Diaphragms for Trichinella spiralis

Series	Number of Diaphragms Examined	Number of Diaphragms Positive	Per cent Positive
Basic	2,174	366	16.8
Random	436	80	18.3
Negative	140	26	18.6
Traumatic	116	16	13.8
	2,866	488	17.0
Jewish	134	1	0.7
Totals	3,000	489	16.3

ber of diaphragms, has an incidence of 13.8 per cent, a somewhat lower incidence than the other series. However, since positive findings fluctuate considerably from time to time in small samplings, there is reason to believe that this series will eventually show a percentage of positives close to the figure of the base series. If the Jewish series with a remarkably low incidence of 0.7 per cent is omitted, it is noted that 17.0 per cent of the remaining diaphragms were positive for trichinae.

Our findings are in quite general accord with the summarized findings of trichina surveys conducted in various parts of the United States by other investigators. These findings are given in Table II.

In each of these surveys, with the single exception of that of Sawitz, only one method of examination was employed. Nolan and Bozicevich [2] have pointed out on the basis of our findings that either the microscopic method or the digestion-Baermann method used alone will detect only 66⅔ per cent of the positive cases. If we apply a correction figure of 33⅓ per cent to the total positives given in Table II, less Sawitz's cases, we have 594 positives, instead of 446 positives, in 3,294 diaphragms, or an incidence of 18.0

TABLE II

Findings of Trichinae in Post-mortem Surveys in the United States

Author	Date	Place	Number of Examinations	Number Positive	Per cent Positive	Method
Whelpley	1891	St. Louis, Mo.	20	1	5.0	Microscopic
Thornbury	1897	Buffalo, N. Y.	21	3	14.28	do
Williams	1901	do	362	21	5.8	do
		Philadelphia, Pa.	7	0	0.00	do
		Baltimore, Md.	126	5	3.96	do
		Denver, Colo.	10	1	10.00	do
Queen	1931	Rochester, N. Y.	344	59	17.2	Digestion
		Boston, Mass.	58	16	27.6	do
	1937*	Denver, Colo.	431	70	16.2	do
Riley and Scheifley	1934	Minneapolis, Minn.	117	20	17.09	Microscopic
Hinman	1936	New Orleans, La.	200	7	3.5	Digestion
McNaught and Anderson	1936	San Francisco, Cal.	200	48	24.0	do
Magath	1937	Rochester, Minn.	220	17	7.7	Microscopic
Sawitz	1937	New Orleans, La.	200	10	5.0	Microscopic and Digestion
Pote	1937	St. Louis, Mo.	1,060	163	15.37	Sections
Scheifley	1938	Minneapolis and St. Paul, Minn.	118	15	12.7	Microscopic
Totals			3,494	456	13.1	

* Reported by Scheifley, 1938.

per cent. While there are several variables in the data given in Table II, such as differences in method, amount of material examined, and changing factors over the period of time represented, it is striking that the corrected incidence figure is in such close agreement with the incidence figure in our series.

The number of larvae per gram of diaphragm material has been recorded in connection with all of our examinations and Table III gives a summary of these findings. The great majority of the positive cases represented infestations with less than 11 larvae per gm. However, 2.5 per cent of the cases had infestations varying between 101 and 1,000 larvae per gm. Unfortunately, we do not know the degree of trichina infestation, as expressed in terms of larvae per gm. of muscle, which will result in clinical symptoms of trichinosis, and it is therefore difficult to translate our findings into terms of cases of the disease. Ferenbaugh, Segal, and Schulze [8] found only 8 larvae per gm. of gastrocnemius muscle obtained on biopsy from an individual suffering from clinical trichinosis. However, it is doubtful whether an infestation of this degree would be sufficient to produce clinical symptoms of disease in all cases. Furthermore, we have little reliable data as to the relative extent of trichina invasion of various muscles. If 0.4 per cent of our present population is infested with 101 to 1,000 larvae per gm., there would be several hundred thousand individuals who would have been ill at some time or other with clinical trichinosis. Obviously, this figure represents the roughest sort of estimate and can have no validity until we are in possession of a great many more data. However, the figure would seem to indicate the occurrence of recognizable cases of trichinosis vastly in excess of the 5,000 to 6,000 reported during the past 95 years.

INCIDENCE IN POPULATION GROUPS

In connection with our diaphragm studies, we obtained information concerning the sex, age, race, occupation, and social-economic status of each individual represented. These data are designed to provide information concerning trichina infestation in different population groups and to determine the validity of our incidence figure as applied to the general population. Table IV presents these data for 2,000 cases in our base series.

In order to arrive at a rational interpretation of the data in this table, we should first examine statistically the validity of our incidence figure of 17.1 per cent for these 2,000 cases. The standard deviation of our percentage of positive cases, as computed by the formula

$$\sqrt{\frac{pq}{n}}$$

TABLE III

Trichina Larvae per Gram Found in 489 Infected Diaphragms of 3,000 Diaphragms Examined

Group No.	*Larvae per Gram*	*Number of Cases*	*Per cent of Cases*
1	Less than 1	177	36.2
2	1 to 10	246	50.3
3	11 to 50	47	9.6
4	51 to 100	7	1.4
5	101 to 500	9	1.9
6	501 to 1,000	3	0.6
7	Over 1,000	0	0
	Totals	489	100.0

where p is the percentage of positive cases, q the percentage of negative cases, and n the total number of cases examined is ± 0.84. Thus, on repeated samples of 2,000 each of the type of material here sampled, we might expect a range of variation due to chance as high as 18.8 per cent and as low as 15.4 per cent, this range being the range of 2 standard deviations above or below the mean of the sample.

An examination of Table IV indicates that there is apparently no special correlation between trichina infestation and most of the population groups represented. The incidence figure for the

TABLE IV

Incidence of Trichinae in Various Groups as Found in 2,000 Post-mortem Examinations—Base Series Nos. 1 to 2,000, Inclusive

Group	Total Number in Group	Number Infested	Per cent Infested
Males	1,487	255	17.1
White	1,011	178	17.6
Colored	464	76	16.4
North American Indians	6	1	....
Chinese	2	0	....
Filipinos	3	0	....
Race unknown	1	0	....
Females	510	85	16.7
White	188	27	14.4
Colored	319	57	17.9
North American Indians	2	0	....
Mexican	1	1	....
Sex unknown	3	1	....
Whites	1,199	205	17.1
Negroes	783	133	17.0
Other races	14	2	....
Race unknown	4	1	....
Military (Army-Navy)	226 *	34	15.0
Officers (commissioned and warrant)	86	17	19.8
Enlisted men	140 *	17	12.1
Army	139 †	22	15.8
Navy	88 †	12	13.6
Families and relatives of military men	40	9	22.5
Civil	1,770	306	17.3
Civilian Conservation Corps	35 ‡	2	5.7
Farmers	22	2	9.1
Veterans, mostly World War	535 ‡	105	19.6
Military-Civil status unknown	4	1	....
Sea (Navy-Merchant Marine)	182	29	15.9
Merchant Marine	97	17	17.5
Land	1,818	312	17.2
Mentally deranged under hospitalization	385	65	16.9
Mentally sound or not under hospitalization	1,615	276	17.1
High economic-social status	445	79	17.8
Low economic-social status	1,456	251	17.2
Status unknown	99	11	11.1
Total cases	2,000	341	17.1

* One case, both soldier and sailor, counted only once
† One case, both soldier and sailor, counted in both groups
‡ Two cases, both CCC and veteran, counted in both groups

TABLE V

Incidence and State of Trichinae by Age at Death

Age at Death	Total Number of Cases	Positive				State of Trichinae		
		No.	Per cent	Per cent 0–50	Per cent 51–100	Live	Mixed	Dead
0– 10	63	1	1.6			1	0	0
11– 20	47	2	4.3			2	0	0
21– 30	168	22	13.1	15.8		13	4	5
31– 40	280	45	16.1			23	9	13
41– 50	541	104	19.2			38	21	45
51– 60	327	52	15.9			21	4	27
61– 70	353	70	19.8			20	7	43
71– 80	146	33	22.6		18.7	7	4	22
81– 90	54	9	16.7			1	1	7
91–100	7	2	28.6			1	0	1
Unknown	14	1	7.1			1	0	0
Totals	2,000	341	17.1			128	50	163

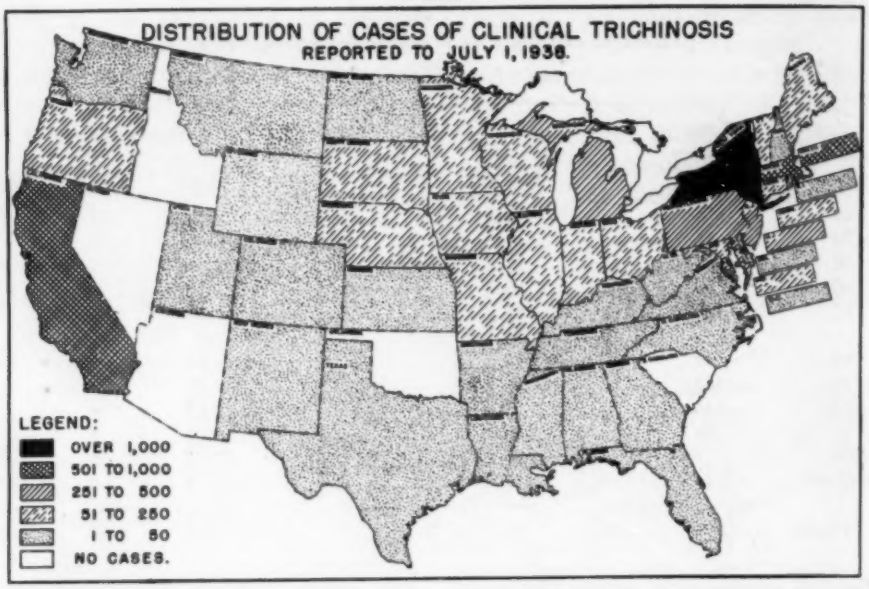
following groups falls within the range of percentage variation possible by chance alone: white males, colored males, all males, colored females, all females, whites and negroes, Army personnel, civilians, occupation by land or sea, mentally deranged under hospitalization, mentally sound or not under hospitalization, high social-economic status and low social-economic status.

White females with 14.4 per cent infested are somewhat below the chance variation. However, the group is still rather inadequately represented and additional cases may bring the incidence figure more in line with the general incidence. The percentage of positives in the military group is slightly below the range of chance variation and a high incidence in commissioned officers is more than overbalanced by a low incidence in enlisted men and Navy personnel, the latter represented as yet by a relatively few cases. The percentage of positives in the veterans' group, consisting mostly of World War veterans, is 19.6, a figure higher than the 2 standard deviations from the mean percentage. However, this group is made up of individuals with ages falling predominately within the decade 41 to 50. As the percentage of positives for this general age group is 19.2 (Table V), it would appear there is no particular correlation between past military service and trichina infestation.

There is one correlation which has not been computed from our data, but which is evident from information furnished by reported cases of trichinosis. There appears to be a very definite correlation between certain geographical areas and trichina infestation. Figure I shows the distribution of cases of clinical trichinosis reported up to July 1, 1938. The heaviest incidence areas lie along the North Atlantic seaboard and along the Pacific coast, areas in which the feeding of uncooked garbage to swine is extensively carried on.

Table V gives the incidence and state of trichinae by age at death for 2,000 cases in the base series. While the number of positive cases in the first two and the last decade is entirely too low to establish a sequence, in general there is a rise in the incidence of trichina infestation with increase in age.

FIGURE I



Such a sequence would be expected if we assume that long life offers greater opportunities for acquiring infestation. However, the decade 51 to 60, with 327 cases represented, shows an incidence of only 15.9 per cent, an incidence lower than that of the two previous decades. Furthermore, although the group incidence in ages 51 to 100 is higher than that in the age groups 0 to 50, both of the incidence figures fall within the range of chance variation of the series incidence. At this time, correlations between age and trichina infestation are not convincing and a larger series of cases must be awaited for support of the theory that individuals in later life should be more frequently infested with trichinae.

Considering the state of trichinae at age of death, infestations with mixed live and dead trichinae and with dead trichinae appear first in the decade 21 to 30, and in general the percentage of dead trichinae increases with increase in age. Such a trend might well be expected since relatively long life would permit of death and calcification of trichinae acquired in earlier decades.

SOURCES OF INFESTATION IN HUMAN TRICHINOSIS

With the exception of a small number of cases due to the consumption of bear meat, human trichinosis rests entirely on the basis of swine trichinosis. It is pertinent, therefore, to inquire into the source of infection in swine.

During the past 50 years or more considerable data have been accumulated concerning the prevalence of trichinae in swine fed on different types of feed. These data have been adequately summarized by Hall [4] and need not be repeated in detail here. They may be expressed briefly as shown in Figure II.

Swine fed on cooked garbage and southern swine raised generally in fields and woods and without easy access to garbage or kitchen scraps rank in the lowest order of importance as sources of human trichinosis. Only about 0.5 per cent of these swine have been found to harbor trichinae.

Next in the order of importance are so-called grain-fed swine, as represented largely by swine from the Central West, of which 1.0 to 1.5 per cent have been

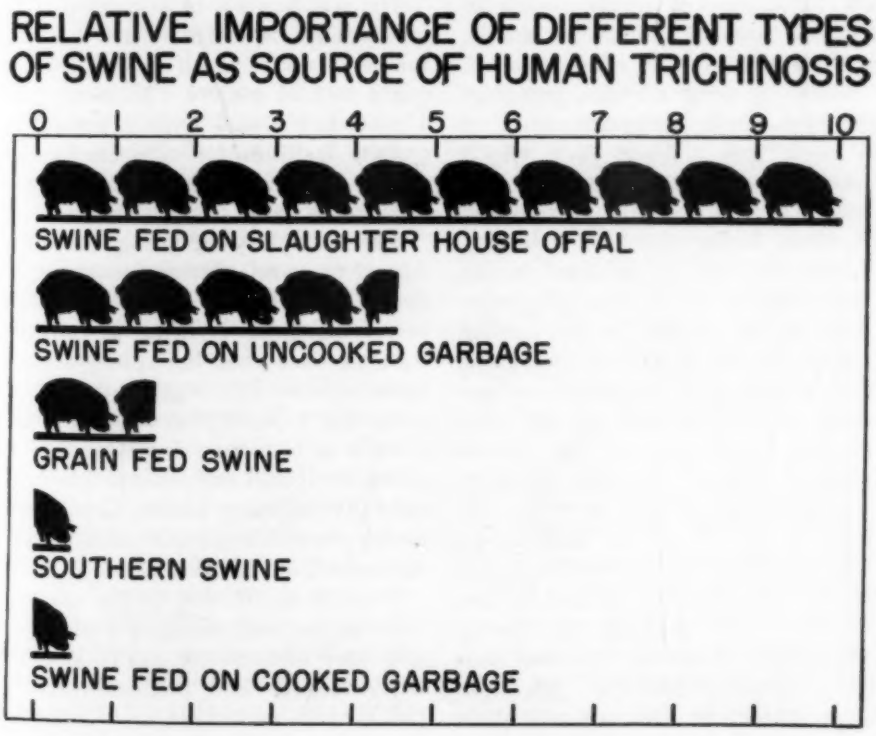
found infested with trichinae. If we exclude the rat as a major factor in the causation of swine trichinosis, it is apparent that these so-called grain-fed swine have not been raised exclusively on grain or on pasture crops but that many of them have received some garbage, probably in the form of scraps or swill from the farm kitchen.

Swine fed on uncooked garbage rank next in the order of importance as a source of human trichinosis and probably today represent the chief source of the disease in man. Since 4.5 to 5.0 per cent of these swine are infested with trichinae, they are approximately 10 times more important as a source of trichinosis than are southern swine and swine fed on cooked garbage.

Evidence indicates that swine fed on slaughter-house offal are very frequently infested with trichinae, since these swine show incidences of trichinae of 10 to 20 per cent. However, the practice of feeding offal to swine has been largely discontinued and this discontinuance, merely as a result of general improvements in sanitation, represents one of the few advances made in the control of swine trichinosis in this country since the disease was first recognized.

It is my opinion that the rôle of the rat as a source of swine trichinosis has been largely over-emphasized. Evidence for such emphasis seems to be based chiefly on the examination for trichinae of rats killed or captured around garbage feeding plants. While it is true that such rats have been found to be frequently infested with trichinae, and that swine do eat rats occasionally, and do occasionally eat carcasses of other swine, such occur-

FIGURE II


RELATIVE IMPORTANCE OF DIFFERENT TYPES OF SWINE AS SOURCE OF HUMAN TRICHINOSIS
0 1 2 3 4 5 6 7 8 9 10
SWINE FED ON SLAUGHTER HOUSE OFFAL
SWINE FED ON UNCOOKED GARBAGE
GRAIN FED SWINE
SOUTHERN SWINE
SWINE FED ON COOKED GARBAGE

rences are not sufficiently frequent to account for the relatively high incidences of trichinae in garbage-fed hogs. If the rat were a major factor in the causation of swine trichinosis one would expect to find as great a prevalence of trichinae in swine fed on cooked garbage as in those fed on uncooked garbage, since there is no reason to believe that rats are less prevalent around plants feeding cooked garbage than around plants feeding uncooked garbage. Garbage is usually handled so carelessly around hog feeding plants that in most places rats would have easy access to uncooked garbage even though the hogs might receive only cooked garbage.

THE PROBLEM OF CONTROL

Today in the United States only two measures are being employed generally to prevent human trichinosis and neither of these methods is aimed at the prevention of swine trichinosis, which we have seen is the source of nearly all cases of human trichinosis. One of these consists in efforts to warn the public by press releases, pamphlet distribution, radio programs, etc., to cook pork well. While such efforts are well intended, and should be continued, they apparently accomplish little since during the past half century there has been no apparent decline in the incidence of trichina infestation in man and no decline in the number of reported cases of clinical trichinosis.

The second control measure is represented by that portion of the meat inspection regulations of the federal Bureau of Animal Industry requiring the freezing for 20 days at 5°F., the heating at 137°F., or the smoking or curing, or both, of pork products customarily eaten without cooking by the consumer. Such products are mainly of the variety of so-called summer sausages. These regulations are adequately enforced, and are adequate safeguards against the contraction of trichinosis from such of these products as are federally inspected. However, since only approximately two-thirds of the meat consumed in the United States is federally inspected, this measure does not represent a general measure of protection against trichinosis.

Other than the measures now being used to combat trichinosis, the following procedures are open to us:

The microscopic inspection of pork for trichinae might be carried out as it is in Germany and some other European countries. However valuable this measure may be in reducing the number of cases of trichinosis over a period of years, it is an expensive procedure and one not geared to the high speed operation of American packing plants. The cost of carrying on microscopic inspection of all swine slaughtered in federally inspected plants would no doubt exceed the present costs of the federal meat inspection service.

The refrigeration of all pork at 5°F. for 20 days in order to kill trichinae would no doubt result in a fairly adequate sort of control. However, such a procedure would require greatly increased facilities for refrigeration and would no doubt add considerably to the cost of pork to the consumer.

The feasibility of using the intradermal or some other antigenic test for detecting trichinous swine immediately before slaughter is being investigated, with the idea that the refrigeration of such pork to kill trichinae would not constitute a prohibitive expense. Even if such a test were infallible, its application could be enforced only in federally inspected plants, thus leaving about one-third of our meat supply unchecked for trichinae.

In contradistinction to the costly or inchoate methods mentioned above, we still have immediately available an entirely feasible and practical plan for the control of trichinosis. Since the

hog fed on uncooked garbage is today the major source of human trichinosis, the most logical approach to the problem seems to consist in the control of garbage feeding. However, before any restrictions are placed on garbage feeding, those engaged in the practice should be given the opportunity of voluntarily instituting effective measures for the prevention of swine trichinosis. In the case of those who do not choose to coöperate voluntarily, other steps should be taken.

The situation calls for local and state laws and regulations providing for the licensing of garbage feeding plants, for the cooking of garbage for a period of time sufficient to destroy all trichinae, and for the supervision of such plants by the proper agency. Licenses should be granted to such existing plants as represent a considerable monetary investment but should be refused for new ventures and for small scale garbage feeders who have little financial stake involved and would suffer little or no financial loss if forced to discontinue the practice.

This is a bare outline of the first step which can be taken under existing conditions toward the control of trichinosis. Details can be worked out to meet local conditions. In some states, existing laws and regulations may provide sufficient authority for a program of action; in other states, it may be necessary to ask for suitable legislation.

In conclusion, it may be pointed out that such a program for trichinosis control will not approach efficiency unless some steps are taken by local health officials to clean up their own backyards. There is no doubt that many American municipalities are contributing directly to the spread of trichinosis through sanction of the practice of feeding uncooked municipal garbage to swine maintained either on farms operated by the municipality or on farms operated by private contractors.

While it is difficult to obtain up-to-date information on the extent of this practice, the *Municipal Index* for 1930 [5] gives data on garbage collection and disposal in 557 cities of over 4,500 population, of which 216, or 38.8 per cent, disposed of their garbage by feeding it to swine. Eddy [6] has recently stated that this method is the one practised in the greatest number of cases, and Toquet [7] has estimated that 50 per cent of cities with a population over 15,000 utilize the hog-feeding method of garbage disposal. Gillespie and Reinke [8] reported that in 1930, 162 of 242 cities in California were disposing of garbage by feeding it to swine. In this connection it will be remembered that of all states, California ranks second in the number of reported cases of trichinosis.

As much of the pork fed on municipal garbage is slaughtered locally, swine maintained on uncooked city garbage are an important source of trichinosis within the municipality.

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Milestones of the Past Fifteen Years in Public Health Nursing*

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1923! Let me set the stage for the birth of the Public Health Nursing Section of the American Public Health Association whose fifteenth birthday we are celebrating.

It was the time of the "Health Fairy," of "Cho-cho" the health clown—the brain-child of the Child Health Organization; of tonsil clinics in rural areas where wholesale tonsillectomies were performed in schools, homes, and churches; of "open-window" school rooms; of courses in tuberculosis nursing and "specialized" tuberculosis nurses; of arguments for "generalization" as against "specialization"; of a high infant and maternal death rate being valiantly challenged by funds provided by the Sheppard-Towner Act. We find in a magazine the last picture of a horse carrying a public health nurse in a "buggy" on her country rounds and read that the occasion of the picture is one for lament as the Nursing Committee is selling the mare to buy a Ford—with tears on the part of all (maybe not the mare). The last stories of post-war work in France and Italy were being published; three university schools of nursing had been established at Minnesota, Yale, and Western Reserve. It was the time of demonstrations: the Commonwealth Fund, the Milbank Memorial Fund, the Metropolitan Life Insurance Company. We note with sympathetic understanding an address at an A.P.H.A. meeting by a forward-looking health officer who demands: "After the Demonstration—What?"

The American Child Hygiene Association and the Child Health Organization combined in this year to become the American Child Health Association to lead an honorable life until the close of 1935. Councils of social agencies were creeping over the land and state laws of public health nursing were being reviewed and modernized. There were 35 states with state supervising nurses in their departments of maternity and infancy—thanks to the ways and means provided by the Sheppard-Towner Act.

In this year—1923—the American Public Health Association met in Boston, and the Public Health Nursing Section received its christening from the Governing Council of the A.P.H.A. Of its birth Margaret K. Stack,[1] then doing public health nursing in Connecticut, writes:

> The reasons for this decision (to recognize the Section) on the part of the Governing Board of the American Public Health Association are due, we believe, first, to the good prenatal care the Section received in advice and help from the Board and various members who urged the development of such a

* Read before the Public Health Nursing Section of the Ameriran Public Health Association at the Sixty-seventh Annual Meeting in Kansas City, Mo., October 25, 1938.

Section, second, to the earnest desire on the part of the Section itself to be so well born that it would be of real help to the parent body.

There is some misunderstanding in the minds of both health officials and public health nursing regarding many points that have to do with the development of a public health nursing service. In some instances this is due to lack of knowledge on the nurse's part of the problems in administration of which the health officer may not approve but which he cannot change, and in some instances is due to the fact that the health official does not always realize that the public health nursing group has a contribution to give other than the actual nursing service it renders. It seems logical, therefore, that the American Public Health Association, which includes among its members a large number of health officers, both state and local, should be the clearing house for discussion of all such problems.

Lest there be a thought in the mind of anyone that the Nursing Section in this Association means building up another nursing organization, banish the thought. The only reason for a "Nursing Section" of this Association is because in no other organization of which we know is the opportunity given for the health officers and the public health nurses to meet as members and coworkers, and by fair and free discussion arrive at decisions that will be of help to all.

When it was a year old, the Public Health Nursing Section listed 125 members at its first formal meeting. It is quite significant, I think, that one of the first papers presented to this Section was on the relation of the public health nurse to the practising physician.

Moving on to *1924*, we find the Delano Red Cross nurses starting their work in rural areas. We find from the N.O.P.H.N. Census of that year that there were 11,171 public health nurses in the United States. In that year, standard report forms were published; the administration of insulin, discovered in 1922, was becoming a problem to the visiting nurse services. The question of amalgamation of public health nursing services in a given community was being widely discussed. Community chests were gaining in popularity.

By *1925*, the Public Health Nursing Section was trying out, for the first time, joint sessions with other A.P.H.A. Sections and with considerable success, judging by the attendance. The first joint session was held with the Health Officers Section. Lest we think the subjects we now discuss are fresh and new, let me record two of the subjects discussed 13 years ago: "The division of responsibility between the public and private agency"; "How far is nursing care the responsibility of public health nurses in the health departments?" On the former point, I note that Dr. Lee K. Frankel brought a round of applause by his cryptic remark that he "hoped for a measure of respect between the health department and the private agency!"

In the general field in 1925 we find all child health problems very much to the fore. Plans for the White House Conference had started. Child labor conditions were rousing the nation to action. In this year the John Hancock Mutual Life Insurance Company established its nursing service. In the foreign field, a public health nursing committee had been appointed by the International Council of Nurses.

Mental hygiene and social hygiene programs in connection with nursing services were becoming the fashion of the day. At this time the first minimum qualifications for appointment of public health nurses were published by the N.O.P.H.N. and a survey of 17 plants where industrial nursing was being carried on was undertaken and published. The N.O.P.H.N. made its salary study an annual routine. The problem of Civil Service appointments occupied the thought of both health officers and public health nurses in our Section meetings, and the problem of generalized and specialized services was still with us. In this connection, a note from Miss Fox's report of a conference at the Children's Bureau has a familiar ring.

She writes: "That the Children's Bureau is appointing a committee to consider nursing reports from the field because of the difficulty the Bureau has had in giving acceptable accounting of the Maternity and Infancy work done by nurses in generalized services." The committee consisted of two state directors of public health nursing, representatives of the Red Cross, a nurse with county experience, and Children's Bureau representatives.

In this year also it is rather surprising to find, for those of us who were not following federal activities closely, that the need for more effective coördination among the departments in government was being considered. I quote from an article[2] in the *Public Health Nurse:*

> The need for the more effective coördination of these scattered branches of the government which are concerned with public health is apparent. Duplication of effort, to be sure, is not as great as might be expected, but there is some, and there would be much more efficacious operation if there were a central federal organization in the health field. During the last twenty years or more, a national department of health has been recommended, and several notable, but unsuccessful, attempts have been made to secure such a department or bureau. There once was, in fact, a National Board of Health, established by Congress in 1879 for a four-year period. Its activities were restricted in 1882, it received no appropriations after 1885, and the law creating it was repealed in 1893. The Sixty-eighth Congress, which adjourned last March [1925] had before it a plan for a new Department of Education and Relief, regarding which fortunately no action was taken, as the scheme was defective for many reasons. Whether a new department of health should be advocated at this time is a question of political expediency, but certainly there should be a correlated health service, at least under an assistant secretary or a commissioner.
>
> . . . It is to be hoped that a practical plan for correlation of federal health activities will be produced shortly and that when it is and has been decided upon by the medical, sanitary, and nursing professions, and by experts in political science, Congress may be induced to act favorably upon it. Congress should, therefore, be rather positively informed that they do.

We might claim I think that in 1938 Congress *was* "rather positively informed that they do."

1926. For some reason for which I am not bright enough to find a predisposing cause, 1926 was a momentous year in public health and nursing work. We had the Goldmark Report on Nursing Education; the Frontier Nursing Service (1925) got under way; the Grading Committee started; Joint Vocational Service began as an independent vocational placement and guidance bureau; the Harmon Association for the Advancement of Nursing inaugurated its annuity plan for nurses; the first cost studies for public health nursing were published; Dr. Ferrell studied and reported on 298 full-time county health units (a jump from 4 in 1911). We find the first *Journal* articles discussing the distribution of the nurse's time, and time studies. We find in the Public Health Nursing Section of the A.P.H.A. a discussion of reasons for the health department carrying on bedside nursing care, and, incidentally, one of the most interesting reasons I find to be the advantage of a closer relationship to the private physician, since "it gives an opportunity to make him understand and feel the importance of the health department work and show a new usefulness of the department to him." Regional conferences of state nursing supervisors were held in this year. And perhaps, as a most outstanding "Milestone," the National Health Congress was held at Atlantic City. All the national health agencies and many allied groups with health interests met in Atlantic City at that time. I find that we have recovered from that experience sufficiently to consider the possibility of a similar congress during the World's Fair in 1939!

1926 and *1927* were also agitated by the problem of advisory committees for public health agencies. At this time, the committee to study this question which had been appointed by the American Public Health Association and the National Organization for Public Health Nursing made its report, strongly urging the appointment of advisory committees which might preferably be called "Citizen's Committees" for local health department programs. Specific advantages were quoted for the existence of such committees: They maintained unbroken policies in spite of changing personnel; it was possible to free new appointments from political influence; the voluntary committee could demand higher standards; and finally be very influential in interpreting and winning support for the health department program among the citizens of a county or community. The N.O.P.H.N. seems to have been considerably exercised about this recommendation to the point of calling its Advisory Council together to endorse the committee's report and to urge the appointment of such groups. The Advisory Council also discussed at some length the relation of the public health nurse to the health officer and the N.O.P.H.N. was given a charge to develop such national relationships within the health field as would strengthen the hand of the public health nurse locally. I note that in this year the Maternity Center Association experimented in a rural delivery service in Tioga County, N. Y., with the help of Sheppard-Towner Funds. The first institute for board members was held in New Haven in the spring of 1927 which led to the eventual establishment of the Board and Committee Members' Section in the N.O.P.H.N. with a full-time secretary and the *Board Members' Manual*, published in 1930 and revised in 1937.

1927 saw the great Mississippi flood.

In *1928* the first appraisal form for public health nursing appeared. At this time, also, "Nurses, Patients and Pocketbooks" pointed out the oversupply of unqualified nurses being graduated from small schools of nursing. Hourly nursing was coming to be more or less familiar to the visiting nurse services and, internationally, we welcomed the appointment of a public health nurse to the Health Committee of the League of Nations.

Shall we pass lightly over *1929–1933?* Or is it worth while to find out something of what happened in those years? Historians say that a true perspective can only be gained on a world event from a distance of 50 years, and we are looking at it within a 10 years period! However, there are certain outstanding points in this period whose imprint is left with us. It is well perhaps to summarize these.

The number of public health nurses increased. Work increased. In 1933, 1,882 unemployed nurses were put to work on part-time jobs, some of which became permanent. Salaries decreased, cuts in special services within agencies had to be made in many instances. Our relation to social work and relief was clarified. The federal government, stepping in to relieve the unemployment situation and supply medical and nursing care to the indigent who were on relief, recognized for all time the policy that medical care includes nursing care and agreed that public health nursing agencies supplying nursing care to those on relief should be paid on a "per visit" basis for such service, just as the doctors were being paid for their care to relief clients. There were many new types of positions opening at this time in federal and state health departments. The U. S. Public Health Service recognized the Minimum Standards for Appointment of Nurses in official positions recommended by the N.O.P.H.N. The

development of the state programs brought to the fore problems of the place of the nursing division in the department of health, and we find Dr. Arthur P. McCormack discussing this in one of the meetings of the Public Health Nursing Section. In 1929 a study of nurses in industry was carried on, and in 1930 a study of negro nursing. Qualifications for positions were published again in 1930 and 1935 and the objectives of public health nursing defined.

It is interesting to recall that in this time when so many unqualified nurses were being brought into the public health field, there were three basic requirements urged upon all communities employing this type of worker. You remember we said that the qualifications of the worker should be passed on by a professional committee before employment, that there should be qualified supervision of such workers, and that a period of introduction to the field should be given. The development of possible service from subsidiary workers and visiting housekeepers was and is still a matter of discussion.

The depression is reflected in some of the titles of topics discussed at the A.P.H.A. meetings. "Getting Public Health Nursing Needs Across to Appropriating Bodies," and "Fitting Public Health Nursing into the Budget." Other related subjects were: "The Use of the Layman," "A Study of Volunteer Workers," "Health Insurance Plans for Families," "The Development of Community Nursing Councils," the question of "Public Support to Private Agencies," and "The Purchase of Nursing Service from Private Agencies." The better coordination of all programs for economy's sake was in our minds during these years.

The N.O.P.H.N. Census in 1931 showed 15,915 public health nurses in the United States.

In *1931* Miss Nelson was engaged as Consultant to the U. S. Public Health Service—a period of study which led to her recommendation for the appointment of a public health nurse in the Research Division of the U. S. Public Health Service.

In general, other events were taking place: Nurses were being employed as hostesses on the air lines; certification of nurses in states was becoming more frequent. In *1933* the Birth and Death Registration Area was complete for the United States. The Public Health Nursing Section appointed in 1933 a committee to study nursing in state health departments. In 1933 also a report was submitted on "Public Health Nursing Throughout the World" from the International Council of Nurses.

Out of the depression we see other lines of interest leading to the future—the 5 day week, annuities for nurses, expansion in state supervisory work and county work, new routines for referral to clinics, the relationship of private agencies to the medical profession, and we see, through the President's own interest, a development in the work for crippled children.

In *1934* the "Survey of Public Health Nursing" brought clearly before us our shortcomings as teachers, and "Physical Defects—The Pathway to Correction" (a study among school children in New York City) revealed the gaps in the school nurse's program. Institutes were started to assist nurses in the field to supplement their knowledge and enrich the content of their visits. By this time the discussion of generalization versus specialization was dying out and generalization seemed to have come to stay.

By *1935* all of us were ready to see more vigorous leadership toward a national health program develop from Washington and in 1935 the Social Security Act was passed. In the U. S.

Public Health Service and the Children's Bureau qualified public health nurses began guiding the state nursing programs—with 10 regional supervisors to assist them. At this time also the National Health Survey was undertaken. At this date every state but one in the Union had a state supervising nurse in the state department of health. We became aware of a growing emphasis on bedside care of the sick and the hope that this care could be extended to the rural areas; pneumonia campaigns started and the orthopedic program got under way. The N.O.P.H.N. Orthopedic Council was established the following year.

In *1936* the A.P.H.A. reported 81 fellows and 456 active members in the Public Health Health Nursing Section. A committee was appointed that year to study the relation of official agencies to private programs and another committee to review possible projects for research. Of the Social Security Act, Miss McIver, holding the position of Senior Public Health Nursing Consultant in the U. S. Public Health Service writes:

> The Social Security Act is not an emergency measure. It is designed for the purpose of developing a permanent program of social betterment. However, the appropriations authorized by the Act must be made by Congress on an annual basis. Whether Congress will continue to appropriate the funds authorized by the Social Security Act will depend in a large measure upon the results which are accomplished. Increased opportunities always mean increased responsibilities. Federal, state, and local health agencies which are responsible for the administration of this program must accept the challenge and show that they are capable of doing a good job. If all health workers—including health officers, engineers, nurses, and others—accept as a common objective *the development of a well rounded public health program,* and if all personnel are appointed on the basis of merit and not because of politics or personal favoritism, it will not be difficult to convince appropriating bodies that public health is both a social and economic necessity.[3]

In *1937* Miss Randall's study of personnel practices in official agencies was published ("Personnel Policies in Public Health Nursing"). Under Dr. Parran's leadership, the national syphilis program was well under way, and a conference on syphilis was held in Washington.

In *1937* the N.O.P.H.N. had its Silver Jubilee and a record membership. Noteworthy also was the first occasion on which the N.O.P.H.N. met officially with the A.P.H.A. at its New York City meeting.

I cannot go on to *1938* and a summary of this 15 year period without stopping a moment to record the loss of three leaders in the public health field whose passing crippled public health nursing. I have chosen only three since they were leaders in their particular line of activity. In 1925 we lost Anne Hervey Strong, R.N., in 1931, Dr. Lee K. Frankel, and in 1934, Dr. William H. Welch. These friends of public health nursing contributed far more than we realized at the time. Their names, I think, should be inscribed with honor on any record of the past 15 years.

1938, like 1923, 1926, and 1935, would appear to be a year in which a larger "Milestone" should be erected, for in January of this year the National Conference on the Better Care of Mothers and Babies was held in Washington, and the National Health Conference in July. The significance of the latter gathering only the future will reveal. We already know that the character of the gathering and the trend of its thinking and its influence on medical programs are without precedent.

During all these years we have seen an increase in the things which we desire most—the number of nurses, their standards for appointment, the quality of their service, the distribution of their

services. There are 23,271 public health nurses in the United States this year. We have seen our conception of the number of nurses needed by the country change from 1—2,500 to 1—1,800. We are on the verge of seeing a new coördination between the public and private agency of new plans for the prepayment of medical and nursing care. We have seen the Public Health Nursing Section grow from 125 members to 731 today—a strong consulting and consultant body closely related to the other Sections of the A.P.H.A. and ready to take its part in whatever activity of the Association touches public health nursing. We hope the Section will continue to serve as it was originally planned, as a "clearing house for all problems that concern the health officer and the public health nurse" for their mutual benefit and the ultimate benefit of the public whom we both serve.

What of the future? This was not in my assignment, but I am tempted to quote a statement from the report of the National Resources Committee published in May, 1938, which reads as follows:

> Any advance in public health will depend upon the quality of scientific research, the efficiency of organization and administration of health services, and the adequacy of economic support of these services.

I can think of no better goal for the Public Health Nursing Section of the A.P.H.A. than to share through the A.P.H.A. in promoting these three essentials to the advancement of public health.

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Dextrose in the Food Industries and Its Health Status*

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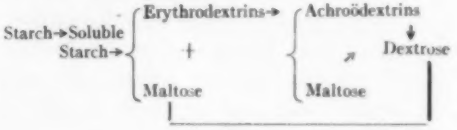
DEXTROSE † or refined corn sugar is a relatively new sweetening and preserving agent in the food industries. It was not until 1922 that Newkirk [15, 16] made possible the commercial manufacture of dextrose by his special crystallization process.

Refined dextrose is made by converting highly purified starch with hydrochloric acid. After the conversion, the excess acid is neutralized with sodium carbonate and the neutralized liquor is passed through centrifugal machines, filter presses, and bone char filters to remove all unconverted substances. The clarified liquor is concentrated in triple effect vacuum pans to 30° Bé and again passed over the bone char for further clarification and to remove any dissolved coloring matter. This liquor is then concentrated to a heavy gravity in the finishing vacuum pan. The heavy gravity liquor is put in large cylindrical crystallizers, and slowly agitated for from 90 to 100 hours. During this agitation, crystallization takes place.

The heavy liquor, containing the crystals of pure dextrose, is run into centrifugal machines which separate the crystals from the liquor. The crystals are washed with pure water until nothing remains but the crystallized dextrose.

The crystals are then removed from the centrifugal basket and delivered to hot air rotary dryers where the excess moisture is removed. The sugar is then screened and is ready for packing.

The sugar made by the above process is 99.5 to 100 per cent pure dextrose.



Anhydrous dextrose is prepared by recrystallization of the hydrated dextrose, ground very fine and heated to 60°C. to remove the molecule of water of crystallization. This is the form of dextrose used for intravenous injections and in various pharmaceutical and medicinal preparations. Manufacturing details have been fully described by Krno,[10] Cathcart,[4] and Arnold.[1]

The present annual production is increasing steadily year after year. Refined dextrose makes up only about 25 per cent of the total annual corn sugar

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* Contribution 322 Massachusetts Agricultural Experiment Station, Amherst. Read before the Food and Nutrition Section of the American Public Health Association at the Sixty-seventh Annual Meeting in Kansas City, Mo., October 25, 1938.

† Also known as d-glucose, hydrated dextrose, dextrose hydrate, anhydrous dextrose and cerelose.

Until dextrose was accepted by the U. S. Pharmacopoeia, 10th revision in 1926, it was commonly known by the synonym "glucose." This confusion of names is unfortunate for the "glucose" of the Pharmacopoeia is corn syrup, a mixture of dextrin, maltose, dextrose and water and has quite different properties from refined crystalline dextrose.

As defined by the U. S. Food and Drug Administration in *Service and Regulatory Announcements*, 4th Revision, 1933: "Dextrose is the product chiefly made by the hydrolysis of starch or a starch containing substance, followed by processes of refining and crystallization. (When derived from cornstarch, dextrose is known commercially as refined corn sugar.) Hydrated dextrose contains not less than 90 per cent of dextrose and not more than 10 per cent of moisture, including water of crystallization. Anhydrous dextrose contains not less than 99.5 per cent dextrose and not more than 0.5 per cent of moisture."

production of one billion pounds. The balance consists of confectioners' glucose, syrups, etc. The total sugar consumption per capita in our country is about 115 lb. Of this, 16 lb. is eaten as candy.

In truth, this is a staggering amount of sweets, when it is considered that in 1800 the per capita consumption was only about 10 lb. On the other hand, sugar is one of our most available and convenient and inexpensive sources of body energy, and scientific evidence has still to be adduced to show that any harmful effects result from the ingestion of large amounts of it.

The corn crop for 1938 is estimated by the U. S. Department of Agriculture at 2,260,000,000 bushels—a truly stupendous raw material source for dextrose manufacture. At the prevailing low cost of corn, dextrose can be manufactured to sell at considerably below the market price of sucrose. For these and other reasons we shall probably see in the future increased use of dextrose as food.

As yet dextrose makes up a relatively small part of the nation's sugar bowl; yet, with its increasing use as pure sugar and in foods and beverages, we may well inquire, both as public health officers and as consumers, into the nutritional and sanitary status of this food.

PROPERTIES OF DEXTROSE

Commercial dextrose is a fine, white crystalline product containing from 7 to 9 per cent water. Our analysis shows the following composition.

	Regular dextrose hydrate per cent	*Recrystallized dextrose hydrate per cent*
Moisture	7.75	8.00
Dextrose	91.40	91.80
Purity of dextrose solids	99.80	99.90
Ash	0.05	0.009
Iron	0.0001	0.0002
Chlorine	0.016	0.002
Sulfates (SO_4)	0.008	0.008
Silica (SiO_2	0.0035	0.005
Calcium	0.0022	0.002

The high purity of dextrose is shown by this analysis. It corresponds to the purity of good quality cane or beet sugar. Because of the water of hydration in the dextrose molecule it is necessary to use 109.4 lb. of dextrose in order to supply the same sugar solids that are present in 100 lb. of sucrose. Dextrose is approximately 75 per cent as sweet as sucrose. According to one's point of view this lower degree of sweetness may be considered either an advantage or a disadvantage. The solubility of dextrose in water is somewhat less than that of sucrose, hence because of sugar crystal formation, jellies and preserves cannot be manufactured using only dextrose. Our laboratory [6] as well as Van Arsdale and Eddy [23] have found that mixtures of dextrose and sucrose containing from 20 to 50 per cent dextrose are very satisfactory in the manufacture of most fruit products such as jams, preserves, jellies, and canned fruits. As shown by Berkeley and Hortley [2] dextrose solutions show considerably higher osmotic pressures than sucrose. That dextrose syrups do actually possess somewhat greater bactericidal action against yeast and bacteria than sucrose, is experimentally shown by Morrison.[13]

In crushed fruits and fountain syrups dextrose is now very extensively used in proportions of from 25 to 50 per cent of the total sugar.[8, 17] The carbonated beverage industry uses up to 40 per cent of total sugars as dextrose in its syrup bases. This sugar, according to Buchanan,[3] gives a more suitable body, reduces sweetness, and improves flavor. When dextrose replaces sucrose in carbonated beverages the added acid can be reduced by 10 to 15 per cent.

The Institute of American Meat Packers have found that reducing sugar (dextrose) prevents fading due to oxidation of the hemoglobin, and thus holds the red color. It is particularly efficacious in wet pickled meats, sau-

sages, and even in fresh and canned meats.

The extensive use of dextrose and various corn syrups in the baking industry hardly need be mentioned. As shown by Morison and Gerber,[12] dextrose and sucrose are interchangeable in yeast bread doughs and the loaf volume, flavor and sweetness are identical. The usual sugar percentage in bread formulae is now about 6.

Both dextrose and corn syrups are used in immense quantities in the manufacture of candies, sweet chocolate, marshmallows, and other confections. In dairy products, ice creams and sherbets may contain from 15 to 25 per cent of the total sugar as dextrose according to Tracy[22]; and in condensed milks the use of dextrose is advantageous as reported by Hunziker.[9]

Results in our own laboratory[6, 8] show that from 20 to 50 per cent dextrose can be used successfully in sweet pickles, relishes, and similar products. Other investigators have shown the feasibility of using dextrose in frozen or "cold pack" fruits in candied and glacéd fruits, in Maraschino cherries, licorice, wines, in fermented sauerkraut, dill pickles and olives. Considerable quantities are also used in pharmaceutical and medicinal products.

I need not enumerate more ways where dextrose can and is being used in foods and beverages. The fact remains that we are buying and eating large quantities of dextrose every day whether we know it or not. I think the industry is rather desirous that the public be informed about dextrose if one can believe the extensive advertising slogans seen everywhere in this country and in England.

LEGAL AND PUBLIC HEALTH ASPECTS

In 1930 the Secretary of Agriculture, Arthur M. Hyde, ruled that refined dextrose, as well as sucrose, could be used in the manufacture of food products without label declaration. Hence, the extensive use of dextrose in foods dates back only 8 years. While a few states still require the labelling of some manufactured foods containing dextrose, the wisdom of retaining such regulations seems questionable. Certainly no fraud is perpetrated and no nutritional or public health aspects are concerned. Dextrose and sucrose have practically equivalent purity and nutritive values. The former contains fewer microörganisms. Since corn is one of our staple agricultural crops and a surplus is often produced, it would seem to be in the public interest to extend rather than to restrict, the use of refined dextrose. In fact, it is doubtful that any state fully enforces its local regulations relative to the labelling of dextrose in all the products in which it is used—that is, candy, bread, ice cream, jams, preserves, pickles, condensed milk, meats, soda fountain syrups, canned foods, and carbonated beverages. In fact, there is no sound public health argument for doing so. The presence in a state of a competing sugar industry is not a sound reason for legislating against dextrose.

Nutritionally, dextrose and sucrose are equivalent. Excellent reviews on the physiology and biochemistry of sugars have been recently published by The Council on Foods of the American Medical Association,[5] and by Pierce[18] in the *Journal of Nutrition*. Dextrose is the normal sugar of the blood. When eaten, it is quickly absorbed as such and circulates unchanged in the blood stream. The work of Roberts[19] indicates that dextrose is absorbed from the intestinal tract more rapidly than sucrose, though Murlin and Manly[14] show that the absorption rates for the first 2 hours after ingestion are not significantly different. The studies of Schultz and Blish[20] on children showed that dextrose was the most efficient of the sugars studied for the alleviation

of the accumulation of lactic acid due to exercise. That the nature of the carbohydrate in the diet has relatively little effect on calcium and phosphorus retention in the body was reported by Speirs and Sherman.[21] One of the more recent clinical (and possibly practical) uses for dextrose is suggested by the work of Haggard and Greenberg of Yale University.[7] They found that the toxic effect of alcohol is influenced in inverse proportion to the amount of sugar in the blood. Thus, sugar will greatly decrease the pharmacological effect of alcohol, i.e., make it less intoxicating.

An excellent text called, "Dextrose Therapy in Everyday Practice" by E. Martin[11] reviews more than 2,000 articles on experimental and clinical studies on dextrose.

It is not the purpose of this short paper to show superiority of dextrose over other forms of carbohydrates, but merely to point out that a great mass of physiological evidence exists which proves that dextrose is certainly not inferior to other sugars in a nutritional sense. With refined carbohydrates now forming about 25 per cent of man's caloric intake we should take stock of refined dextrose, which within a very few years, has become a major component of so many of our everyday prepared foods.

Relative to the use of dextrose from a sanitary point of view, essentially no problems exist. The sugar is pure, clean, practically free from bacteria or other microörganisms, and contains no toxic contaminants such as heavy metals, fluorine, selenium or arsenic.

It remains only to state that a careful review of the physical, chemical, and physiological properties of dextrose, its present use in the food industries, and its hygienic aspects lead to the conclusion that refined dextrose as marketed today in the United States presents no important public health problems.

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Preparation of Scarlet Fever Toxin*

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THE publication by Rane and Wyman[1] of a flocculation test for scarlet fever toxin was of great potential value in the development and study of better scarlet fever antigens, just as Ramon's discovery of the flocculation test for diphtheria toxin facilitated the study of diphtheria toxin and toxoid. This paper is concerned with verification of this important work of Rane and Wyman, and with the use of the method, to guide the production of scarlet fever toxin of higher flocculating values. The flocculating test is especially advantageous in the study of scarlet fever toxins, since titration by the usual skin test method is time consuming and relatively inaccurate, unless many rabbits[2] or Dick positive human volunteers are used.

Until recently the production of potent scarlet fever toxin on beef or veal infusion broth or semi-synthetic media was none too successful, toxins with skin test doses of 200,000 to 300,000 per milliliter being considered very strong. O'Meara,[3] however, was successful in producing toxins containing 1,000,000 to 5,000,000 skin test doses per ml. with a "straight line" digest of horse muscle containing 1 per cent peptone. One of the disadvantages of this method is the use of horse muscle which makes the toxin unsuitable for human immunization.

The crude toxins prepared by Rane and Wyman[1] in their study of the flocculation reaction averaged 2–3 L_f units and 120,000 to 180,000 S.T.D. per ml. and were concentrated to obtain rapidly flocculating toxins. By modification of their methods we have, during the past year, produced crude toxins with L_f values as high as 26 units and with skin test doses as high as 1,000,000. Concentration of these toxins is therefore unnecessary and the L_f determinations are now made with the same ease and accuracy as in testing diphtheria toxin by the flocculation method.

Because of the potency of these toxins the methods of preparation are given in detail.

INFUSION MEDIUM

This medium is prepared by infusing 1 lb. of ground fat-free veal in 1 l. of distilled water for 12 to 18 hrs. at 5°C. The mixture is then boiled for 15 to 20 min., the meat strained out and pressed, and the liquid filtered through paper. Two per cent proteose peptone is added and the pH adjusted to 7.6 to 7.8 with sodium hydroxide. The broth is finally filtered through absorbent cotton and dispensed in 2 l. amounts in 3 l. Erlenmeyer flasks. It is sterilized by autoclaving at 120°C. for 20 min.

* Read before the Laboratory Section of the American Public Health Association at the Sixty-seventh Annual Meeting in Kansas City, Mo., October 28, 1938.

INFUSION FREE MEDIUM

The semi-synthetic medium is a modification of the Wadsworth and Wheeler formula [4] for the preparation of diphtheria toxin and has the following composition:

Potassium phosphate C.P. K_2HPO_4	1.0 g.
Sodium phosphate C.P. $NaH_2PO_4 \cdot H_2O$	1.0 g.
Magnesium sulphate C.P. $MgSO_4 \cdot 7H_2O$	0.2 g.
Calcium chloride C.P. $CaCl_2$ anh.	0.1 g.
Peptone, Proteose, Difco	20.0 g.
Ammonium lactate, C.P.	4.5 g.
Succinic acid	2.0 g.
Distilled water	1,000.0 ml.

The peptone is dissolved in approximately 700 ml. of distilled water. Each of the salts is dissolved separately in a small quantity of water and added to the peptone solution in the order given. The volume is brought to exactly 1,000 ml., the pH adjusted to 8.0 with sodium hydroxide and the medium boiled for 3 to 5 min. It is filtered through paper, dispensed in 2 l. amounts in 3 l. Erlenmeyer flasks, and autoclaved at 120°C. for 20 min.

OTHER MEDIA

The dried complete medium described by Bunney and Thomas [5] for production of diphtheria toxin can also be used for the preparation of scarlet fever toxin. We have obtained toxins containing 400,000 S.T.D. and 9 L_f units with this medium.

Although toxins have been prepared with the horse muscle digest medium described by O'Meara [3] which contained 1,000,000 S.T.D. per ml., flocculation of these toxins with our antitoxins has thus far been unsuccessful.

CULTURE

Toxin is prepared from the Dochez No. 5 strain of hemolytic streptococcus. The culture is retained on blood agar, virulence being maintained by weekly passage through mice. Before a lot of toxin is prepared the strain is acclimated to that specific lot of broth by several successive transfers in 5" by 5/8" culture tubes containing 6 ml. of the medium enriched by the addition of 0.1 per cent dextrose.

TOXIN PRODUCTION

The method of inoculation, incubation, adjusting of pH, and addition of 50 per cent dextrose solution for the infusion medium is similar to that described by Rane and Wyman.[1] Because growth is slower on the semi-synthetic medium the cultures are kept at 37.5°C. for the first 18 hrs. but otherwise the method is identical with that used for the infusion broth.

After the required quantity of dextrose has been added and purity tests are made, sufficient phenol is added to the pure cultures to make a concentration of 0.5 per cent. The toxin is then filtered and tested for potency.

TITRATION OF TOXIN

The S.T.D. of the toxins is determined by intradermal injection into rabbits, every 5th or 6th lot being tested on human volunteers.

In the flocculation test rapidly flocculating accurately standardized antitoxins containing 150 to 200 units are used, antitoxin being measured with the T. evan-O'Brien syringe. The technic is similar to that described by Rane and Wyman.[1] The S.T.D. and L_f value of the last 18 lots of toxin prepared within the past 18 months are given in Table I.

The speed of flocculation of the crude toxins varies with the L_f value, toxin No. 210 containing 20 units flocculates in 20 minutes at 45°C. and No. 206 containing 4 L_f units requires 10 to 12 hours at this temperature.

With the stronger toxins flocculation may appear in several tubes simultaneously. It is necessary to dilute these toxins to obtain accurate readings. This phenomenon was also observed by Rane and Wyman in the flocculation of their concentrated toxins.

TABLE I

A Comparison of the L_f Value and the S.T.D. of 18 Lots of Crude Scarlet Fever Toxin

Lot No.	*Broth*	*S.T.D. per ml.*	*L_f per ml.*
204	Infusion	500,000	6
205 A	"	1,000,000 *	26
B	"	1,000,000	16
206	"	1,000,000 *	4
207 B	"	500,000	11
208	Complete dried medium	400,000	9
209	Infusion	500,000	9
210	"	500,000	21
211	"	<300,000 *	8
212	"	1,000,000	7
213	"	1,000,000	14
214	"		24
215	"	1,000,000	20
216	"	300,000 *	8
217	"	1,000,000	4
218	Semi-synthetic	1,000,000	19
219	"		7
220	"	500,000 *	20

* Checked on human volunteers

DISCUSSION

The results in Table I indicate that there is very little correlation between the skin test dose and the L_f value of our crude toxins, particularly when prepared from the infusion medium. Toxins No. 205 A and 206, for example, had a skin test dose of 1,000,000 but the former toxin had an L_f value of 26 and the latter an L_f value of only 4. That these were the correct determinations and not nonspecific zonal flocculation values was verified by testing these toxins over a range of 2 to 60 units. The results with semi-synthetic media indicate that, with this medium, there may be a closer relationship between the S.T.D. and the L_f value. Rane and Wyman,[1] on the other hand, found a definite L_f–S.T.D. ratio, one L_f unit being equivalent to approximately 60,000 S.T.D. of toxin. Their results were based upon flocculation tests on toxins purified by ammonium sulphate but the concentrates were prepared from both infusion and infusion-free media.

Several toxins prepared from the horse muscle digest medium described by O'Meara[3] which were particularly strong when the toxicity was measured by the skin test reaction have, in our hands, been found entirely devoid of flocculating ability in the crude state. The author of this method also found these toxins to be lower in flocculating substance than toxins prepared by other procedures.

The L_f value from one flask to the next with a given lot of toxin prepared at the same time and in the same manner varies considerably. The approximate titer of 10 cultures comprising one lot of toxin is given in Table II.

TABLE II

The Variation in L_f value of 10 Cultures Comprising a Single Lot of Scarlet Fever Toxin

Flask No.	*L_f per ml.*
1	14
2	22
3	18
4	<10
5	<10
6	<10
7	18
8	<10
9	22
10	<10

The L_f values of the individual cultures of this lot vary from less than 10 to 22 units, and each lot of toxin given in Table I was therefore pooled from 10 to 12 individual cultures.

We are continuing this study with the view of finding a simpler method of preparing high potency toxin with the Dochez No. 5 strain. The recent report of Rane and Wyman [6] describing the production of toxin containing 10 to 80 L_f units from the No. 594 strain of hemolytic streptococcus may be very important if this strain is found to have as wide a valency as the Dochez No. 5 strain.

It will remain to be shown whether there is any correlation between the L_f value and the antigenicity of scarlet fever toxin.

SUMMARY

The report of Rane and Wyman showing that scarlet fever streptococcus toxin flocculates with antitoxin has been confirmed.

Methods for the preparation of crude scarlet fever toxin with hemolytic streptococcus, strain Dochez No. 5 and having L_f values of 4 to 26 units and skin test doses as high as 1,000,000 which flocculate directly are described.

NOTE: We wish to express our gratitude to W. E. Bunney for his valuable suggestions and support throughout this study and to J. T. Tripp for testing our toxins on human volunteers.

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Results of Venereal Disease Control in Canada*

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THE venereal disease control movement in Canada began during the Great War. Previous to the war factors had begun to operate which were calculated ultimately to call the problem to public attention. The most potent of these was the discovery of the Wassermann reaction. The gradual application of this test, especially in institutions, revealed that syphilis was far more prevalent than anyone had suspected. One recalls that in pre-Wassermann days the relationship between such conditions as aortic aneurysm, general paralysis of the insane, and tabes dorsalis with syphilis were not considered to be invariable. With the development of the Wassermann technic the relationship was confirmed but in addition positive diagnosis was established in thousands of other cases and the discovery of additional thousands of cases of entirely unsuspected disease created a growing appreciation of the fact that in syphilis we had a problem of major public health importance. There was also a growing appreciation of the seriousness of gonorrhea as a major cause of disability. In 1913, a group of British physicians, headed by Sir William Osler, Regius Professor of Medicine at Oxford, and Sir Clifford Albutt, Regius Professor at Cambridge, wrote a letter to a morning newspaper in London, England, calling attention to the need for governmental action. The result was the Sydenham Royal Commission appointed by the Asquith Government which sat for 3 years and brought in a startling report in April, 1916.

Evidence was presented to this Royal Commission to the effect that 10 per cent of persons living in cities in Great Britain were infected with syphilis, that there were 100,000 fresh infections of this disease a year, and that gonorrhea was much more prevalent than was syphilis. The two diseases were responsible for an enormous amount of disability, and the beds of hospitals, insane asylums, and institutions for the blind and defective were filled by thousands of their victims. The rôle of syphilis as a major cause of death was recognized.

While interest in the subject was rapidly growing war broke out. During previous wars scientific knowledge had not progressed enough to suggest particularly strenuous methods of control, but in the Great War venereal diseases were from the beginning treated as a serious problem. The routine Wassermann was not instituted as a means of keeping syphilitics out of the army, and many syphilitics became soldiers. Regular inspection resulted in the detection of many new

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cases of gonorrhea and syphilis in enlisted men. All cases when discovered were promptly isolated and treated. Venereal disease hospitals were erected, and in every army the segregation of thousands of venereal cases provided visible evidence that the prevalence of venereal disease seriously interfered with army efficiency.

It was also realized that all of these cases originated in the civil population and in order to prevent fresh infection methods were evolved to trace and treat civil cases. The use of the so-called social case sheet in connection with investigating the origin of infection in soldiers made it possible in the Province of Ontario to arrive at an estimate of the prevalence of the two diseases.

In 1916, a deputation from Toronto to the Canadian Conservation Commission submitted that 12.8 per cent of patients in the Toronto General Hospital showed a positive Wassermann reaction. The following year, 1917, routine Wassermann reactions in Montreal General Hospital showed that 26 per cent of the patients in that hospital were infected. The seriousness of the situation both in military and civil life resulted in the appointment of a Royal Commission on Venereal Diseases in Ontario, and in 1918 the Ontario Legislature passed the Ontario Act for the Prevention of Venereal Diseases. This legislation provided a standard type of legislation upon which legislation in most other provinces was based.

There has been much discussion of the results of the Scandinavian program and of Scandinavian legislation. Typical Canadian legislation included most of the characteristic features of the Scandinavian law. Legislation of nearly all of the provinces included a provision whereby the physician was required to report cases of venereal disease to the local health authority by number. Where the patient neglected treatment the physician was instructed to report the case by name, whereupon the medical officer of health was empowered to give such direction for the treatment of the patient and, if necessary, for his detention, isolation, and prevention of infection from him, as he deemed necessary and as authorized by regulations which were subsequently drawn up. Persons under arrest or in custody could be examined by the medical officer of health and treatment carried out under his direction. Another important section of the typical venereal disease legislation provides that where the medical officer of health is credibly informed that any individual is infected with venereal disease and may infect others, steps may be taken to ascertain the condition of such person and institute treatment if necessary.

Hospitals are required to make effective provision for the examination and treatment of venereal disease. Persons other than legally qualified medical practitioners are forbidden to treat venereal disease. The advertising of venereal disease remedies is forbidden.

Under various venereal disease acts, of which the above provisions are typical, most of the Canadian provinces undertook to place venereal disease in a category similar to that in which other communicable diseases are placed. Venereal disease literature of a standard character was printed in most of the provinces in order that the personal education of the venereal disease patient might not be neglected. It was felt that the Canadian legislation was at least as adequate and far reaching as any other for the control of these sinister maladies.

Legislation, however, was not sufficient to control venereal diseases. It was necessary to provide clinics for the thousands of patients who were likely to apply for diagnosis and treatment, lacking the necessary funds to pay for it. In addition we had scarcely emerged

from the stage where it was considered highly improper to use the words gonorrhea or syphilis in public. Obviously people in general knew little or nothing about the signs or symptoms or seriousness of venereal diseases. Even if infected they were unlikely to realize the importance of prompt and efficient treatment. An educational campaign was necessary.

Partly because public opinion was aroused and to a degree because of the interest of a far-sighted member of the Dominion Cabinet, the Honourable N. W. Rowell, first Minister of Health for Canada and now Chief Justice of the Supreme Court of Ontario, a conference was called in Ottawa, May, 1919, for the discussion of a national venereal disease control program. All Provincial Chief Officers of Health, as well as representatives of many national organizations, were present.

There had been in the United States a fine wartime venereal disease control program. The Chamberlain-Kahn Bill had provided what seemed to be the beginning of a fine civil program. Secretary of War Baker kindly sent two army officers to the Canadian conference to describe the activities commencing in the United States—and largely because of the fact that the Chamberlain-Kahn Bill had provided for state subsidy in this field, at the Canadian conference the sum of $200,000 annually was set aside out of Dominion funds for this purpose:

1. The maintenance of a Division of Venereal Diseases at Ottawa
2. The partial subsidy of a voluntary association to undertake public education
3. The making of grants to the various provinces in proportion to their population and on condition that each province spend in addition an amount equal to their Dominion grant.

This Dominion-wide scheme came into existence simultaneously with the establishment of the Dominion Department of Health in 1920.

The subsidizing of a voluntary organization was an extremely important part of the plan. It was felt that in the absence of organized public opinion a change in the federal government might easily result in a Dominion administration unfriendly to Dominion participation in the scheme or that failure to keep the public fully informed as to the need for the continued appropriation of public funds for venereal disease control might result in an apathy which would destroy the scheme with equal effectiveness. Therefore it was resolved to make no mistake about insuring the continuance of organized public education. This was a definite part of the scheme which resulted in the machinery of the plan remaining intact for 11 years. The Canadian scheme came into effect to a degree as the result of the example set by the United States in their fine wartime plan and by the possibilities which seemed to be opened up by the Chamberlain-Kahn Bill. It preceded the present splendid coördinated plan in the United States by 15 years.

The expenditure on venereal disease control in Canada, with a population of 10,000,000, amounted to $400,000 annually by the Dominion and the provinces alone for a number of years. The amount of Dominion grants for venereal disease control was later reduced and, in 1931, as the depression became acute and partly as a result of the depression, the Dominion grants were discontinued altogether. Later the grant to the voluntary association, now known as the Health League of Canada, an organization with a broad program of health education, including venereal disease, was restored in part and a grant of $50,000 was made this year (1938) by the Dominion to pay for drugs used by the provinces in the treatment of venereal disease. It is

hoped that this action by the Dominion Government indicates the renewal of Dominion leadership in this field.

The assumption of Dominion leadership in Canada, in 1920, in the venereal disease control program, had immediate effects. The provinces stimulated by the financial support of the Dominion Government immediately commenced to organize special departments under specialist officers. Clinics rapidly sprung into existence in all of the provinces so that, while previous to the development of the Dominion-wide scheme there were a few scattered clinics and no coördinated action, soon all provinces were coöperating. Shortly there were a hundred clinics in operation and the number of treatments increased year by year. The machinery of clinic management including social follow-up methods progressively improved.

The voluntary association which from the beginning was an integral part of the scheme was for the first year of its existence called the National Council for Combating Venereal Disease. This organization took the lead in the necessary educational program. Chief officers of health for the province became executive members of the association and with prominent citizens, lay and medical, assisted in the public spreading of information on all phases of the subject. The utilization of a moving picture, "The End of the Road," a wartime film developed through the coöperation of the American Social Hygiene Association and the Young Women's Christian Association, shown to hundreds of thousands, was instrumental in attracting thousands of patients to the newly established clinics.

An arrangement with the distributing company whereby the words, "venereal disease," must be used in all advertising copy in all parts of Canada soon accustomed Canadian newspapers to the frank discussion of a subject which had previously been studiously avoided, in both news and editorial columns. As a result of this early arrangement there has been for many years now little tendency on the part of Canadian newspapers to avoid the frank discussion of the Venereal Disease problem. In the second or third year of the scheme the voluntary association, by this time known as the Canadian Social Hygiene Council, was fortunate in procuring the services of Mrs. Emmeline Pankhurst, the famous leader of the Suffrage Movement in England. Mrs. Pankhurst, a great and sincere woman, for several years a member of the staff of the Canadian Social Hygiene Council, made a wonderful contribution to the cause. Campaigns were organized in which Dr. J. J. Heagerty, at that time Director of the Venereal Disease Division at Ottawa, Mrs. Pankhurst, the General Secretary of the voluntary association, and provincial health officers addressed great meetings in various parts of Canada. Campaigns instituted throughout the Dominion using these methods at this time were extraordinarily successful in enlisting public sympathy and support.

An unusual type of campaign was instituted in the Province of Quebec. In this province it was decided to depend almost entirely on a voluntary scheme. No very definite legislation was put on the Statute Books. Instead Dr. A. H. Desloges, Director of the Division of Venereal Diseases, instituted a unique method of obtaining public coöperation and developing his educational campaign. In the Province of Quebec we have a population composed largely of French-Canadians of the Roman Catholic faith. A direct appeal was made to the Church for cooperation in a great campaign of enlightenment. The response was prompt and striking. Meetings were arranged in all parts of the province presided over by priests, bishops, and even archbishops. Competent medical men lec-

tured, films were shown, and literature was distributed.

Organization of centers for free treatment was developed and trained physicians administered treatment.

I refer to this coöperation of the Roman Catholic Church in Quebec because I believe it to be unique in the history of organized educational methods for the control of this particular type of disease. Meanwhile work was carried on throughout the other provinces of Canada, all of which coöperated in the coördinated scheme under Dominion leadership.

The Canadian scheme had 3 essential factors:

1. Federal leadership resulting in coöperative action among the Dominion, the provinces, and municipalities.
2. A strong voluntary association to keep up a continuous educational program. This educational program not only educated the individual to seek treatment if infected, but it induced the tax payer to endorse the expenditure of public funds on venereal disease control.
3. Adequate legislation in all but one province.

This plan was continuous between 1920 and 1931. The withdrawal of federal grants in 1931 might well have been calculated to wreck the entire Canadian scheme. However, the passage of years had meant the stabilization of provincial efforts and the result was that although the provinces were compelled to carry on by themselves, and although in some cases budgets were reduced, still venereal disease control work continued throughout the whole of Canada.

The voluntary association lacked government subsidy in the lean period, yet managed to develop the moving picture, " Damaged Lives," which since 1933 has been shown in practically all English speaking countries as well as in some others. This year this picture is reported as showing for the first time in South Africa, Singapore and the Straits Settlements, the Philippines, India, and China. As a result of the Canadian scheme we have records of the treatment of several hundred thousands in clinics, and although the reporting by physicians has been inadequate, unquestionably many other thousands have sought treatment from private physicians who otherwise would not have done so.

It is extremely difficult to appraise the results of a venereal disease control plan as statistics in this field are likely to be misleading. Surveys have been done by the Canadian Social Hygiene Council, now the Health League of Canada, in 3 cities—Toronto, Winnipeg, and Ottawa. The first surveys showed a lower incidence in Toronto and in Winnipeg than in 17 American cities surveyed at about the same time, in 1929. Subsequent surveys have brought out some extremely interesting results. The last two surveys done in 1937 were in Toronto and Ottawa. These surveys undertaken by a joint Committee of the Health League of Canada and the Academy of Medicine were carried on by writing circular letters to all practising physicians and to all clinics and all institutions in an attempt to ascertain the number of cases of gonorrhea and syphilis under treatment at one time. The Toronto survey and the Ottawa survey showed approximately the same percentage of venereal disease in the population. For example, the rate of incidence of the two diseases in Ottawa was 9.95 per 1,000 population as compared with 9.56 per 1,000 in Toronto. The total number of cases of syphilis and gonorrhea reported through the survey in Toronto, in May, 1937, showed 6,188 in an estimated population of 645,462. There were 3,639 cases of syphilis and 2,549 of gonorrhea, rates of 5.6 and 3.94 respectively per 1,000 population.

The first survey done in Toronto was in 1929 and since that time the actual

number of cases under treatment had increased, but there was a remarkable change in the type of case under treatment. In the 1929 survey there were 909 cases of "early" syphilis under treatment. In 1937 this number had been more than cut in half. There were 433 cases under treatment.

In 1929 there were 2,259 cases of "late" syphilis under treatment. In the 1937 survey this number had increased to 3,266. In other words there was an actual decrease in "early" cases under treatment of over 50 per cent, and an increase in the number of "late" cases under treatment of considerably over 50 per cent. It is a little difficult to understand what such statistics mean unless one considers them side by side with the records of the results of routine Wassermanns in institutions. Table I gives the record of syphilis in Toronto General Hospital, 1916–1935.

TABLE I

Routine Wassermanns Positive in Toronto General Hospital

	Per cent		*Per cent*
1916.....	10.4	1926.....	4.5
1917.....	9.95	1927.....	3.8
1918.....	5.9	1928.....	3.5
1919.....	8.8	1929.....	3.2
1920.....	9.0	1930.....	3.4
1921.....	6.3	1931.....	2.7
1922.....	6.0	1932.....	2.5
1923.....	6.2	1933.....	2.5
1924.....	5.6	1934.....	1.7
1925.....	5.8	1935.....	1.5

In the same time in the nearby hospital for Sick Children the percentage of routine Wassermann tests which were positive fell from 5 per cent to less than 1 per cent. In St. Michael's Hospital, Toronto, the percentage of positives over the last 5 years has averaged 2.03 per cent. In Kingston General Hospital in Eastern Ontario the latest report is 1.3 per cent.

Considering these statistics with the statistics concerning the number of early and late cases under treatment, one is forced to the conclusion that in the period under review there has been a marked fall in early syphilis. In addition, hospital statistics prove that there is much less late syphilis. In spite of this a greater number of cases of late syphilis are under treatment. One must conclude that the detection of late syphilis, particularly by means of the routine Wassermann reaction, has improved.

Dr. Parran [1] in discussing a paper by Dr. Einar Rietz, Commission of Health in Stockholm, Sweden, states that in the Rigs Hospital in Copenhagen, the Dean of the Medical Faculty and Professor of Obstetrics, said that among nearly 2,000 deliveries over 3 years the number of cases of syphilis as shown by routine Wassermann tests and careful histories, varies from 30 to 35 per year. A recent survey in the Lying-in Hospital of Toronto General Hospital showed that in 1,000 successive pregnancies the Wassermann was positive in but 3 cases. Apparently the Copenhagen rate was 1.7, the Toronto rate 0.3.

After every great war in history the late end results of syphilis have become more evident. The Canadian Department of Pensions and National Health stated that shortly after the war two reliable sources of information, one European and the other American, forecast that 2.5 to 4.5 per cent of syphilitics would have developed tabes or general paralysis of the insane in 20 years from the date of initial infection but that as a matter of fact only 0.5 per cent of known cases of syphilis in the Canadian Expeditionary Force have developed either of these serious nervous system sequelae. Similarly there has been a marked decrease in congenital syphilis and in other end results such as heart disease of syphilitic origin. I can find no evidence whatever that there has been any decrease in gonorrhea.

There are many other additional evidences of decrease in syphilis. University medical schools report the greatest difficulty in finding primary cases of syphilis to demonstrate to students. Dr. Harold Orr of the Social Hygiene Division of the Department of Public Health of the Province of Alberta, reports that the incidence of syphilis in Alberta jails has been reduced from 16 per cent in 1920 to 4 per cent in 1937. He states that in a clinic in Edmonton during the past year there has only been one primary sore and not a single case of secondary syphilis.

I believe that I am correct in saying that up to 1931–1932 in spite of deficiencies which might be demonstrated Canada had a venereal disease control scheme which was second to none in efficiency. The withdrawal of Dominion grants in 1932 had a serious effect on the venereal disease control scheme in Canada. These grants by the Dominion Government to the provinces were withdrawn in the face of recommendations made by the groups of specialist clinicians representing all of the provinces, called in conference in different parts of Canada. A review of the recommendations is interesting in that they summarize a number of the essentials for venereal disease control in the future.

The Canadian Conferences of Clinicians (specialists in the venereal disease field) recommended as follows:

1. That intensive propaganda and education in this field be continued and that the value of concerted action throughout the Dominion be emphasized.

2. That more attention be paid to the personal education of venereal disease patients in order to insure continuous attendance.

3. That clinics be kept open from 8 a.m. to 12 p.m. in order to provide for early treatment (within 8 hours after exposure).

4. That methods be evolved to insure the continuous treatment of transient patients by providing them with a form upon which records of treatment given them may be inscribed by successive clinics or physicians.

5. That the problem involved in the treatment of indigents in rural areas be dealt with by provincial departments of health.

6. That provision for fever treatment of cases of general paralysis of the insane be provided in all large general hospitals.

7. That in view of the fact that many physicians still give voluntary service in venereal disease clinics provision be made for the proper remuneration of all physicians attached to venereal disease clinics.

8. That all venereal disease clinics be equipped with darkfield apparatus for the diagnosis of primary syphilis and that all hospitals with venereal disease clinics procure such apparatus.

9. That in view of the ever increasing number of patients attending genitourinary clinics showing the effects of mal-treatment of gonorrhea, teaching of medical schools of this subject be improved.

10. That similar facilities for the improved teaching of syphilis be established and that special reference be made to darkfield examination.

11. That the inclusion of specific questions on the subject of gonorrhea and syphilis in the annual examinations in medicine and surgery would be a distinct contribution in the campaign against venereal disease.

12. That medical associations be asked to include papers on venereal disease in their programs for meetings.

13. That meetings of specialist clinicians be held once a year possibly in connection with the meetings of provincial medical associations at which the latest methods and information on the subject might be discussed.

14. That a specific publication for the instruction of physicians in all phases of the question of venereal disease be developed.

These are but some of the recommendations which were brought forward as essential to the further development of the Canadian venereal disease control scheme and in order that these recommendations might be made effective it was urged that the contribution of the Dominion Government to the plan be increased.

I am able to report that there has been a renewal of interest, that this year for the first time since 1932 the Dominion Government has made a contribution to the scheme in the form of

payment for drugs used in treatment in clinics. This amounts to $50,000.

A committee of the Health League of Canada has completed a book of instruction for the guidance of the physician which will be issued generally to physicians by the Dominion Department of Health. Plans for the carrying on of treatment in rural areas have been improved by the provision in some provinces of funds for the payment for treatment of indigents by private physicians, and necessary drugs are provided free. The provision of facilities for taking specimens for darkfield examination in outlying districts and transportation of such specimens to a central laboratory in a convenient mailing packet has facilities for diagnosis of early syphilis in remote areas.

Many of the improvements in the Canadian scheme still remain to be achieved. We have had a fine coöperative effort which has accomplished a great deal, yet we must acknowledge that during the last few years the progress which was characteristic of the early years of the movement has not been made. Essential and specific improvements in the scheme are suggested by the recommendations of physicians especially interested in the ultimate success of the venereal disease program, a few of which are described in this paper. Venereal diseases are controllable although as a problem they are more difficult to deal with than are most of the other major problems in public health.

Both in the United States and in Canada these dangerous maladies are a national problem, common to all states and all provinces. As such they deserve the attention of federal authorities. I believe that we have proved in Canada that under Dominion leadership a great deal can be accomplished. With the fine coöperative scheme you have developed in the United States you are achieving similar results. I suggest that *only* under central leadership can such a problem be effectively dealt with.

Syphilis, toward the end of the Great War, was characterized by Sir William Osler as the greatest single cause of death among the infections. This meant that he considered that syphilis as a killer outranked tuberculosis, cancer, and pneumonia. As a matter of fact syphilis for a time in England was characterized as the "great killer." Syphilis in Canada is no longer the great killer. Hospital statistics prove that. Yet, syphilis we still have with us in spite of a yearly reduction in the incidence of primary cases, and the fact that in 1936 392 fresh cases of general paralysis of the insane were admitted to Canadian hospitals for the mentally ill, is proof that syphilis, although many of its end results have been almost eliminated, still does a great deal of damage. As for gonorrhea, serious though the disease is, there is little evidence that its incidence has been reduced either in Canada or elsewhere.

I believe that the future holds great possibilities not particularly because the seriousness of venereal diseases alone is recognized but because of the fact that it is becoming more generally recognized that most illness is preventable, that there is no logic in filling expensive hospital beds with people who should not become ill and cemeteries with the bodies of those who should still live. As nations recognize the fact that their greatest asset is long-lived healthy and efficient men and women, and as we build machinery for the preservation of health on a national scale these most tragic of maladies will disappear with the rest of the unnecessary germ-borne maladies which have destroyed the health and shortened the lives of humans in the past.

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Industrial Hygiene Program in a State Health Department*

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ANY program of industrial hygiene will depend upon two major factors: the definition, and the objectives of industrial hygiene.

Webster states that industrial hygiene is "a system of principles or rules designed for the promotion of the health of our industrial population." The objectives are the formulation, institution, and promotion of such principles or rules.

Based upon such a concept, the organization and development of a division of industrial hygiene require the close coöperation of many individuals and groups. Bristol[1] has outlined groups concerned as follows:

1. Employee and his dependents
2. Employer
3. Physician and his coworkers, such as dentist, pharmacist, nurse, chemist, engineer, social worker, and public health worker
4. Hospital—public and private—and allied institutions, such as clinics and health centers

To these I should like to add one other, the government—local, state, and federal. No one dares deny that governments have a right to be concerned about the health and well-being of their industrial population. They prosper only in so far as their people prosper financially, physically, and mentally. A healthy industrial population not only safeguards and improves our national defense, but it also leads to increased production in factories, mines, and on farms, and therefore indirectly to an increased national income.

In order to bring the various groups concerned into a united action, it is necessary that all understand the problem, or as Sayers[2] has stated, "develop a viewpoint." I believe this viewpoint should be a common one and should involve a consideration of the following:

1. The worker himself—his physical, mental, and social condition. This consideration requires the concerted action of the employer, physician, dentist, nurse, pharmacist, and social worker. These people constitute a "team" to take inventory of a working man's health assets.

2. Environmental conditions. An understanding of these conditions requires the united action of the employer, the engineer, and the analyst whose findings must never be interpreted without the assistance of the physician and his knowledge of the health inventory of the workers exposed.

3. Society in general. This consideration involves "selling" industrial hygiene to all groups possible. It involves carrying the ideas of health

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conservation and promotion, sanitation, good housekeeping, and good health habits from the factories and work places into their homes where they may be of value to all dependents of our industrial population. It involves coordinating the activities and interests of employee, employer, hospital, and allied agency, physician and his coworker, and the government. It involves an interest in, and an understanding of, labor and industrial legislation. And, finally, it requires a keen understanding of the relationship between income, housing, and health as pointed out by Kessler.[3]

To develop properly any division of industrial hygiene it is essential that an accurate health inventory of our industrial population be made. This requires not only preëmployment, but also periodic, medical examinations. These should be thorough and should lead to a complete evaluation of the physical, mental, social, and psychologic condition of the worker. The findings should be used for proper placement; and an effort should be made to determine if there is a relationship between the findings and the worker's occupation, past or present. Neither labor nor industry has accepted fully the value of medical examinations, partly because there have been "chiselers" in both camps and partly because no one has really done a great deal about "selling" the merits of such a procedure. Those industries which have initiated such a policy, employees so affected, and almost all physicians, however, believe medical examinations at regular intervals will help much toward conserving and promoting good health. Page[4] and others have very effectively emphasized the advantages.

A very forceful illustration of the advantages of preëmployment examinations may be gained from figures obtained from one of our large Texas industries which recently constructed a new plant. When no preëmployment examinations were required, their experiences led them to anticipate a cost of $10,000 for hospitalization, medical care, etc., resulting from injuries and illness arising during the period of construction. They then adopted a policy of preëmployment examination, examined 335 applicants, passing 291 as physically and mentally and psychologically qualified for the work. The total cost of medical care, hospitalization resulting from injuries, and illness arising during the period of construction was $76. Adding to this amount the cost of medical examinations and the salary of a personnel director, there was still a saving of over $5,000 in this one instance. Although no disagreement exists as to the value of such examinations, there is a definite misunderstanding among physicians and dentists as to who should make them and what should be done about them after they are made.

Physicians, nurses, and dentists can be well divided into three large groups:

1. Public Health
2. Industrial
3. Private or Family

A division of industrial hygiene may well serve as a disease finding agency for such groups as tuberculosis control, venereal disease, malaria, etc., and relay to each group respectively such findings as are of interest to it. Likewise, the local health officer should be advised and be expected to follow up and take care of such public health problems as may exist. This, therefore, would mean a division of industrial hygiene should serve as a clearing house for all other divisions as regards diseases found in industrial employees.

All abnormalities arising out of the nature of the employment should be reported to, and be handled by, industrial physicians and be paid for by the

responsible industry. The average practising physician does not have adequate time to study the advances made in physical and synthetic chemistry and to keep informed on the possible effects on health of the various materials and chemicals which may be used. This has been convincingly discussed by Legge.[5]

All conditions not directly associated with the nature of the employment should be referred to, and be handled by, the private or family physician and should be paid for by the patient in so far as he is able to pay, but ability to pay must not determine the availability of medical care. No one dares say that only those with contagious and infectious diseases who can pay should receive medical care.

Whether or not a division of industrial hygiene should be responsible for, and make physical examinations is being argued for and against. The merits of such a procedure are well emphasized by the activity in Mississippi under Felix Underwood, M.D., State Health Officer, and J. W. Dugger, M.D., Director, Division of Industrial Hygiene. Physical examinations are made of all factory workers. Such examinations include among the usual routine procedure a tuberculin test, X-ray of the chest of positive reactors, Wassermann, and blood smear for malaria.

An accurate occupational history, as well as a history of disease experience and immunization, is obtained. Those who need immunization receive it. A list of all those who have had typhoid fever is sent to the county health officer, so he may investigate for carriers. Medical findings are made available to the employee, who is advised to see his family physician for an interpretation, to the employer, and to the county health officer. Such a procedure in Mississippi has proved satisfactory. Fisher[6] and Sappington[7] have very forcefully pointed out the benefit of employee health service.

In considering non-occupational diseases and their control, the activity of the E. I. DuPont de Nemours Company and the Caterpillar Tractor Company are of interest. In 1936 the medical department of the former company, under G. H. Gehrman, M.D., Medical Director, made a survey of the employees for syphilis and found 4.2 per cent had positive findings. These results were kept confidential between employee and medical department unless the employee refused treatment. A similar study was made by the latter company under the direction of Vonachen,[8] and of 10,000 men examined 4 per cent had a positive Kahn test for syphilis. Where industries do not have their own medical department (and this is usually the case because most industries are relatively small), a division of industrial hygiene of the state health department could function. It must be emphasized, however, that under such a plan treatment would have to be provided by the family physician.

Not only should the physician and his coworkers be responsible for good medical examinations—physical, mental, and psychologic—but also they should:

1. Play a very major part in procuring from industry accurate morbidity, mortality, and accident records. Without such records there can be no intelligent approach to either the occupational or non-occupational disease problem. Records of absenteeism should be complete with regard to duration, frequency, and cause in each occupation of an industry. In this way only can a definite type of action be indicated. One example of the value of such records was well illustrated by Bloomfield[9] in his discussion of evaluating the sickness problem needing attention in the iron and steel industry. These records should, of course, be available not only to the medical

department of the particular industry involved but also to public health officials—such as administrators of a division of industrial hygiene—so that the information may be used to conserve and promote health in other industries of a similar nature but without records of absenteeism.

2. Teach employers and employees proper health habits—mental and personal hygiene. When we realize that the report on "Medical Service in Industry and Workmen's Compensation Laws"[10] recently published by the American College of Surgeons reveals that for each day lost from work because of occupational disease 60 days are lost because of industrial injury, and 885 days are lost because of non-industrial injury and illness, we can readily understand why a division of industrial hygiene may have difficulty in justifying its existence if it considers its problem to be only that of the study and control of occupational diseases. There can be no doubt that industrial hygiene must broaden its program to be one of industrial health conservation and promotion—a public health program.

3. Emphasize the value of safe, adequate, and nourishing food and a well balanced diet. The fads and fantasies of foods and diets affect no group more than the industrial group. The tempo of our age is conducive to "fast living" particularly among our working group. This frequently leads to disturbances of the gastrointestinal tract ultimately ending in fanciful, distorted, and unbalanced diets.

It is also believed by many authorities that the average American breakfast and lunch are entirely inadequate and unbalanced. Such conditions are thought to be conducive to the occurrence of industrial accidents.

4. Supervise recreation and rest periods—emphasizing the probable relation of fatigue to accidents. Recreation among industrial groups must not only be encouraged but also be graded and supervised in order to prevent too strenuous exercises or over-indulgence. No one is more qualified to render this service than the medical man.

5. Insure a safe water and milk supply as well as an approved sewage disposal system—including industrial wastes.

6. Supervise a program of accident prevention and first aid instruction. This activity is usually taken over by other agencies. The "viewpoint" and plans for small industries might well be laid and made by a division of industrial hygiene.

7. Promote and encourage rehabilitation—the value of which has been pointed out by Kessler.[11] This is an activity which has been sadly neglected. As preëmployment and periodic medical examinations become more common, a higher percentage of prospective employees are likely to be refused employment. Many of these individuals with minor defects can be rehabilitated, and some agency must assume the responsibility of promoting or sponsoring such activity.

8. Supervise hospitalization and convalescence. Many employees, either intentionally or unintentionally, evade hospitalization; and many return to their work from an illness before they are fully restored to health. These individuals may be a hazard not only to themselves, but also to their fellow workers. A thorough medical check-up is very desirable after each illness before regular work is again entered into.

9. Initiate ideas and institute a program for the reduction in the number of abortions. The incidence of criminal abortions is unknown. However, all people are agreed that the numbers are enormous. Much of this condition is brought about by a lack of responsible and ethical source of birth control in-

formation. The lack of such information to women in industry who are in no economic position to bear children is deplorable. The solution, however, is still rather remote.

We pass on to the second major consideration — environmental working conditions. The place of the engineer in this field cannot be more effectively discussed than it has been by Bloomfield.[12] I will briefly recall some of the problems. Public health engineers and chemists are concerned not only with determining environmental conditions as they exist, but also with the effect of these conditions upon health. This, therefore, places them in intimate contact with the physician and his group with whom they work hand in hand. Engineers and chemists are also concerned with the effectiveness of control measures.

It has been the procedure in most states to make preliminary surveys of industrial establishments for the location of potential health hazards. This plan has been followed in Texas. The physician, engineer, and chemist can gain more if they make such surveys in company with each other. In these surveys observations are made of the materials used, processes involved, environmental conditions, by-products, finished products, etc. The potential health hazards located are probably identical in most states, and, therefore, Texas might well use the findings of Johnson, *et al.*[13] in St. Louis. This statement, however, is not intended to detract from their value. We believe the greatest value is derived from the contacts with industry and the knowledge the surveyor gains of industrial processes.

Engineers and chemists of a division of industrial hygiene are really industrial sanitary officers. They concern themselves with problems of:

Lighting—adequacy, intensity, and glare
Ventilation and air space
Dust and fume control
Environmental air sanitation in general
Temperature and humidity
Sanitation—toilets, drinking fountains, washrooms, lunchrooms, sewer connections, and plumbing installations
Machine guarding
Protective clothing and devices
Fire prevention and protection
Housekeeping in general

This group of workers holds an enviable position in the general program of industrial hygiene. The tendency has been to emphasize occupational diseases and their control and to pay less attention to those other diseases which perhaps have no direct connection with occupation. The industrial hygiene physician has interested himself more in health engineering than the industrial hygiene engineer has interested himself in the promotion of better health regardless of conditions involved. Industrial hygiene physicians can well afford to absorb from these engineers the enthusiasm and interest which they manifest, and direct the program of industrial hygiene so that it will not only be a public health engineering program, but a public health program in the broad sense.

It is obvious that not only industrial hygiene physicians, but engineers too, must acquaint themselves with the economics of labor and industry as well as with legislation affecting these same groups. This problem requires a thorough understanding not only of environmental working conditions and the probable effect upon health, but also of human psychology. Sappington[14] states that in 1935 legislation relative to compensation was introduced in over 40 states. Undoubtedly much of this was ill advised. Eleven states now have a general coverage act, 10 a schedule, and 2 a special coverage, 31 have a general designation for employments covered; 9 enumerate hazardous employments covered; 2 designate employments for gain; 4

enumerate extra hazardous employments; and 1 has a very limited classification covered. Thus we have a rather confusing system of coverage. It appears that no one would be in better position to pass on the merits of proposed or existing legislation than a division of industrial hygiene, and any legislative body certainly should avail itself of such guidance.

The third major factor to consider in formulating a program of industrial hygiene is the reaction of society in general. Because of the large number of groups and people involved, the task of developing a common viewpoint, of selling a program, and of making it acceptable to all groups is very difficult. What industry approves, certain groups of labor will automatically disapprove without just cause. What insurance companies recommend is often not satisfactory to industry. What is agreeable to all other groups may not be agreeable to "organized medicine." The task of bringing all groups together requires tact, diplomacy, firmness, sympathy, knowledge, understanding, and a fair sense of judgment. It requires the services of individuals who might be classed as "charming borrowers."

There are now 21 states and the District of Columbia which have compensation for occupational diseases in some form. Other states are certain to follow. Whether these states should be guided by their respective divisions of industrial hygiene in electing specific or general coverage may be disputed, but everyone must realize that a division of industrial hygiene will play a very important part in whatever program is adopted.

Finally, we come to the question of income and housing and the effects each may have upon health. Is it possible that we are approaching the entire health program from the wrong end? Can any permanent good arise from any program we are now promoting in industrial hygiene unless, first of all, the economic status of the worker is improved? If workers were financially able to provide themselves and dependents with proper and adequate food, clothing, shelter, sanitary facilities, medicine, and medical care, would our task not be much simpler? I shall leave this for you to answer.

It is not to be implied, however, that any division of industrial hygiene should promote, sponsor, supervise, or carry out such a program as we have outlined. The program given represents our view of the problems existing in industrial hygiene. Those industries having their own medical services really have, or at least should have, units of industrial hygiene functioning according to the broad interpretation. Their experiences, however, should be made available to other groups. Those industries having no medical services (and this includes a greater number of them) must be provided for either through their own efforts individually or collectively or through those of a government. At any rate, some central agency must assume the initiative. Such a plan will lead to uniformity in form of reporting sickness, be it occupational or otherwise; in control measures; in medical examinations with subsequent placement of men in jobs for which they are fitted; in compensation and rehabilitation; and finally in disseminating knowledge for health promotion.

These are the objectives toward which George W. Cox, M.D., State Health Officer of Texas, is striving to direct his Division of Industrial Hygiene.

In summary, it appears that a well balanced and properly functioning division of industrial hygiene should:

1. Be a part of a health department.
2. Consist of personnel trained to think of industrial hygiene as a public health problem

involving not only health conservation in its broad sense, but also health promotion and rehabilitation, be it physical or mental.

3. Consist of, or have available for consultation and assistance, physicians, dentists, engineers, chemists, nurses, social workers, educators, and, last but not least, competent administrators.

4. Have a part in the promotion and guidance of the various activities discussed even though it may not carry out the actual work through its own personnel.

5. Act as a clearing house for all agencies as regards finding of diseases in our industrial population.

6. Promote a health program for the 49 million wage earners of our country, a group entitled to a better health service than they now receive.

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Is the Lowering of the Death Rate Due Principally to Curative Medicine or to Preventive Medicine?

"Preventive medicine . . . with hygiene and social progress, is playing a more important rôle than curative medicine in the preservation of human life." This is the conclusion which Dr. René Sand draws from a study of the causes of the 28 per cent decrease in the general death rate in Belgium from 1910 to 1935. The importance of preventive medicine is generally recognized in certain diseases, such as smallpox, but the part of preventive medicine is less commonly realized in such conditions as respiratory infections, tuberculosis, and puerperal infections. Social legislation, improvement in conditions of housing and industry, increase in salaries, education, improvement of hospitals, increase in the number of clinics and sanatoria, and the preventive work of the doctor and the visiting nurse have all helped more to decrease the death rate than have progress in therapeutics and diagnosis. However, Dr. Sand points out, it is becoming increasingly difficult to separate preventive and curative medicine because much of modern treatment has a preventive effect. Dental care prevents dental abscesses and pyorrhea; syphilitic treatment prevents the complications of the later stages and also the communication of the disease to others; when the doctor prescribes a diet, he thinks not only of curing the disease, but of the nutrition of the individual afterward. For such reasons as these, preventive and curative medicine are separable only in theory, and the importance of curative medicine cannot be minimized.—*Imprim. Med. Scient.*, Sept. 18, 1938. Bruxelles.

Value of Phosphatase as an Indicator of Pasteurization*

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THE phosphatase test has found a wide application in the control of pasteurization of milk. In New York State it is being used as a routine laboratory procedure in the supervision of pasteurizing plants as well as in the sanitary control of milk supplies. Continued experience indicates that the inactivation of this enzyme can be used to detect improper treatment of milk almost without failure.

Our early studies of the modified Kay and Graham test [1] indicated that a value of 0.04 mg. of phenol per 0.5 ml. of milk was the average maximum limit for milk completely pasteurized at 143°F. However, variations in the operation of pasteurizing equipment, particularly in the time and temperature of preheating and in the methods of cooling, affect the degree of inactivation of phosphatase. We now regard as properly pasteurized a milk which has a phenol value of less than 0.05 mg. per 0.5 ml. The plan of interpretation adopted considers as slightly underpasteurized milk with a phenol value of 0.05–0.08 mg. per 0.5 ml.; as underpasteurized, that with a value between 0.09 and 0.15 mg. per 0.5 ml.; and as an indication of gross underpasteurization, a value of 0.15 mg. per 0.5 ml., or greater.

It was also thought that the inactivation of phosphatase could be measured with sufficient sensitivity to detect accurately a reduction of 5 minutes in the holding time at 143°F., a lowering of the temperature of heating by 1°, or the addition of 0.1 per cent of raw milk. In the comparative study conducted for the Association of Official Agricultural Chemists [2] it was found that this precision was not attained consistently in the examination of samples representing such treatments. During a prolonged period of preheating such as is practised in many pasteurizing plants, the enzyme is progressively inactivated to such a degree that the phenol value after a technical 25 minute holding period is indicative of complete pasteurization, although the legal requirements for pasteurization at 143°F. have not been met. A drop of 1° or more in temperature of heating was detected in this comparative study in 92 per cent of the samples so treated. Pasteurization at 142°F., therefore, necessitates the establishment of a code of phenol values which differs from that used for pasteurization at 143°F.

Neither of these variations in treatment is of practical importance. The addition of 0.1 per cent of raw milk,

* Read before the Laboratory Section of the American Public Health Association at the Sixty-seventh Annual Meeting in Kansas City, Mo., October 28, 1938.

TABLE I

Phosphatase Values of Known Samples of Pasteurized Milk (143° F.), of the Cream Separated by Gravity at 40° ± F., and of the Skim Milk

	Cream							Whole Milk			Skim Milk			
	<0.05 mg./0.5 ml.		0.05–0.08 mg./0.5 ml.		>0.08 mg./0.5 ml.		Control mg./0.5 ml.	mg. phenol/ 0.5 ml. sample			mg. phenol/ 0.5 ml. sample			Control mg./0.5 ml.
Total Samples Examined	No.	%	No.	%	No.	%	Max.	Max.	Min.	Aver.	Max.	Min.	Aver.	Max.
139	105	75	26	19	8	6	0.02	0.05	0.01	0.03	0.04	0.02	0.02	0.02

however, may be of great significance since even such an amount of contaminated raw milk would readily contaminate the pasteurized product. In the comparative study [2] the various laboratories detected 0.1 per cent of added raw milk in only about one-third of the samples so treated. A tendency in many pasteurizing plants to overheat the milk slightly, reduces the phosphatase content sufficiently so that the addition of this amount of raw milk gives a phosphatase value which falls within the limits established for complete pasteurization. Quantities of added raw milk greater than 0.1 per cent apparently, however, can always be detected by the laboratory test.

Whereas the inactivation of phosphatase has proved a useful indicator of pasteurization of milk, persistent reports have been received that samples of cream separated after pasteurization frequently give a reaction of underpasteurization, even when plant inspection indicates that the treatment was adequate. No instances have been reported in which cream, separated from raw milk and then properly pasteurized according to standard procedures, failed to give a definite reaction of pasteurization with phenol values definitely below 0.05 mg. per 0.5 ml. Since the earliest evidence of failure of the test in the examination of cream was concerned with samples which had been separated from pasteurized milk by gravity, we attempted some analysis of the problem by examining 139 samples of known pasteurized milk collected by the staff of the Bureau of Milk Sanitation. The whole sample was first thoroughly mixed and a 10 ml. portion removed for subsequent examination. The remaining volumes were allowed to stand for 48 hours at 40°F., when portions of cream and skim milk were removed. The residues were again thoroughly mixed and additional portions taken for examination. As shown in Table I, only 75.5 per cent of the samples of cream had a phosphatase value indicative of pasteurization. In all cases the phenol values of the whole milk and the skim milk indicated adequate pasteurization. The phenol value of the milk remixed after separation were always found to be the same as that originally obtained.

A similar study has been made of cream separated mechanically from known commercially pasteurized milk, also collected by the Bureau of Milk Sanitation. Temperatures of pasteurization were 142°–143°F. for 30 minutes, 160°–169°F. for 15 seconds, and 180°–189°F. for 15 seconds. The usual temperature at which this cream was separated was between 90° and 110°F., but samples were also collected representing temperatures of separation between 90° and 60°F., and less than 60°F. Irrespective of the temperature of pasteurization or of separation, the phosphatase value of the mechanically separated cream increased with alarming frequency to a value indicative of underpasteurization and, in a few instances, even of gross undertreatment. The phosphatase

TABLE II

Phosphatase Values of Known Samples of Pasteurized Milk, of Mechanically Separated Cream, and of the Skim Milk

Temperature of Pasteurization	No. of Samples	Cream							Whole Milk				Skim Milk			
		<0.05 mg./0.5 ml.		0.05–0.08 mg./0.5 ml.		>0.08 mg./0.5 ml.		Control mg./0.5 ml.	mg. phenol/0.5 ml. sample				mg. phenol/0.5 ml. sample			Control mg./0.5 ml.
		No.	%	No.	%	No.	%	Max.	Max.	Min.	Aver.		Max.	Min.	Aver.	Max.
Separated at >90° F.																
180°–189° F. for 15 seconds	58	33	57	21	36	4	7	0.02	0.03	0.01	0.02		0.02	0.015	0.018	0.02
160°–169° F. for 15 seconds	24	19	79	5	21	..	..	0.02	0.03	0.015	0.023		0.03	0.01	0.02	0.02
142°–143° F. for 30 minutes	34	32	94	..	..	2	6	0.02	0.03	0.01	0.02		0.02	0.01	0.015	0.02
Separated at <90° F., >60° F.																
180°–189° F. for 15 seconds	51	20	39	21	41	10	20	0.02	0.03	0.01	0.02		0.03	0.01	0.02	0.02
170°–179° F. for 15 seconds	4	1	25	1	25	2	50	0.02	0.03	0.02	0.025		0.02	0.015	0.018	0.02
160°–169° F. for 15 seconds	40	24	60	13	33	3	7	0.02	0.03	0.01	0.02		0.03	0.01	0.02	0.02
142°–143° F. for 30 minutes	13	13	100	..	..	..	..	0.02	0.02	0.02	0.02		0.02	0.02	0.02	0.02
Separated at <60° F.																
180°–189° F. for 15 seconds	8	4	50	4	50	..	..	0.02	0.02	0.015	0.018		0.02	0.015	0.018	0.02
170°–179° F. for 15 seconds	4	..	..	1	25	3	75	0.02	0.04	0.025	0.033		0.03	0.02	0.025	0.02
160°–169° F. for 15 seconds	15	13	90	2	10	..	..	0.02	0.03	0.01	0.02		0.03	0.01	0.02	0.02

TABLE III

Phosphatase Values of Pasteurized Milk and of Cream Separated by Gravity at Various Temperatures

Temperature of Pasteurization	No. of Samples	Cream				Control mg./0.5 ml.	Whole Milk			Control mg./0.5 ml.
		<0.05 mg./0.5 ml.		0.05–0.08 mg./0.5 ml.			mg. phenol/0.5 ml.			
		No.	%	No.	%	Max.	Max.	Min.	Aver.	Max
Separated at 40° ± F.										
180°–182° F. for 15 seconds	3	3	100	..	..	0.02	0.017	0.015	0.016	0.02
160°–164° F. for 15 seconds	4	3	75	1	25	0.02	0.02	0.015	0.018	0.02
142°–143° F. for 30 minutes	4	4	100	..	..	0.02	0.017	0.017	0.017	0.02
Separated at 68° ± F.										
180°–182° F. for 15 seconds	3	3	100	..	..	0.02	0.017	0.015	0.016	0.02
160°–164° F. for 15 seconds	4	3	75	1	25	0.02	0.02	0.015	0.018	0.02
142°–143° F. for 30 minutes	4	4	100	..	..	0.02	0.017	0.017	0.017	0.02
Separated at 98° ± F.										
180°–182° F. for 15 seconds	3	3	100	..	..	0.02	0.017	0.015	0.016	0.02
160°–164° F. for 15 seconds	4	3	75	1	25	0.02	0.02	0.015	0.018	0.02
142°–143° F. for 30 minutes	4	4	100	..	..	0.02	0.017	0.017	0.017	0.02

values of the corresponding whole and skim milk indicated proper pasteurization. In order to eliminate the possibility that the cream had become contaminated during the process of separation with some substance other than phosphatase which would react with Folin's reagent, a control test was made on all samples examined. These were without exception low and did not differ from the control values found on examination of the whole milk. The results are given in Table II.

Representative samples of the cream which had a high phosphatase value after separation were then repasteurized in the laboratory and again tested. In all cases a low value indicative of complete treatment was found, showing that the substance causing the high reading in separated cream is heat labile.

In order to obtain further information concerning the effect of temperature of separation, we examined a few samples of cream separated by gravity from pasteurized milk stored at temperatures of 98°F., 68°F., and 40°F. To avoid interference by bacterial growth at the higher temperatures, the samples of milk were each allowed to stand for 2 hours to permit sufficient cream for the test to rise. The results, given in Table III, again show a tendency for the phosphatase value of cream to increase beyond that of the original milk. As indicated, the whole and skim milk were found properly pasteurized in all cases.

A sufficient number of samples has not yet been examined to indicate the frequency of this discrepancy between milk and cream. However, the data suggest that caution must be exercised in the interpretation of the results with cream, particularly since much of that from small pasteurizing plants is separated from excess pasteurized milk. When the laboratory reports indicate inadequate heat treatment of cream samples, thorough inspection of the pasteurizing process should be made before the product is considered actually underpasteurized. It is difficult to explain the cause of this increase in phosphatase content. It is possible, however, that since the enzyme is not completely inactivated at 143° F. for 30 minutes, or 160° or 180°F. for 15 seconds, the fat particles in rising from the milk, either under action of gravity or during mechanical separation, absorb and concentrate in the cream layer sufficient phosphatase to give a reaction of underpasteurization.

In examination of this point, samples of raw whole milk, cream, and skim milk were collected at the separator of a commercial dairy. In order to permit accurate measurement of the phosphatase content of these samples, 0.3 per cent and 0.5 per cent dilutions of each in pasteurized milk were prepared. The results of this experiment, given in Table IV, indicate clearly that in the presence of active enzyme in the whole milk there was a marked concentration of phosphatase in the cream fraction after separation.

It is essential that further study be

TABLE IV

Phosphatase Content of Raw Whole Milk, of the Cream, and of the Skim Milk Diluted with Pasteurized Milk

		Mg. phenol/0.5 ml.					
		0.3 % Dilution			*0.5 % Dilution*		
Sample	*No. of Samples*	*Max.*	*Min.*	*Aver.*	*Max.*	*Min.*	*Aver.*
Whole milk	4	0.07	0.06	0.07	0.13	0.09	0.12
Cream	4	0.34	0.28	0.31	0.46	0.34	0.43
Skim milk	4	0.055	0.05	0.05	0.07	0.07	0.07

made of the effect in terms of the phosphatase test of the separation of cream from pasteurized milk. It may become necessary to establish values for cream which differ widely from those to be used in the examination of whole milk.

SUMMARY

Continued experience with the phosphatase test has indicated that it can be depended upon to give precise information concerning the pasteurization of milk. However, to compensate for variations in treatment it has seemed essential to allow a greater range in the phenol values indicative of pasteurization than was given in our early studies. New values for pasteurization, slight underpasteurization, underpasteurization, and gross underpasteurization have been recommended in the tentative standard methods.[2]

Prolonged preheating or slight overheating may reduce the phosphatase content of the milk sufficiently to make it impossible for the laboratory test to detect technical shortening of the holding time by 5 minutes or the addition of 0.1 per cent of raw milk.

Cream separated from raw milk and then pasteurized has always been found to give a reaction of complete treatment. Cream separated from pasteurized milk either by gravity or by mechanical means tends to have a high phenol value indicative of underpasteurization.

The examination of a raw whole milk and of the cream and skim milk mechanically separated from it showed a marked concentration of enzyme in the cream fraction. It is possible that the fat particles during the process of separation absorb phosphatase and concentrate it in the cream layer, thus producing a phenol value for the cream indicative of underpasteurization. It may become necessary to establish a separate code of readings for cream.

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THE NEW JERSEY MOSQUITO AND YELLOW FEVER

OUR ideas regarding yellow fever and its transmission to man have again had something of a jolt in the report from the Harvard Medical School[1] that the mosquito, *Aëdes triseriatus,* common in New Jersey, is capable under laboratory conditions of transmitting yellow fever to monkeys. At a first test in 1935, some 35 mosquitoes (*Aëdes triseriatus*) were allowed to feed on a monkey which was dying from yellow fever. They were kept for 17 days at a temperature of 28°C., and 6 of the 7 survivors were then allowed to bite a healthy monkey. There was an incubation period of 6 days followed by a transient (1 day only) febrile reaction with a temperature of 104.1°F., but the animal remained in excellent condition for about a month. On the 36th day, however, the monkey died of yellow fever.

Recently 4 other monkeys have been bitten by these mosquitoes after they had taken an infective meal. There was no febrile reaction, but 2 died of yellow fever between the 10th and 13th days. Blood from the two surviving monkeys failed to protect mice against yellow fever. Intracerebral inoculations of mice with emulsions of mosquitoes which had taken infective blood from dying monkeys showed that 6 of 10 of those which had bitten an infected monkey 15 days previously carried the virus of yellow fever. The *Aëdes triseriatus* is found from Maine to Florida and has been found as far west as Montana. The experiments described were done with mosquitoes found near Ithaca, N. Y. The *Aëdes triseriatus* is neoarctic in its distribution.

In nature, as far as we know, this mosquito has never transmitted yellow fever, though J. B. Smith, in 1904, raised the question as to whether it might serve as a vector. If yellow fever should again gain a foothold on our eastern shore the possibility that this widespread species might transmit the disease is horrible to contemplate.

The discovery of jungle yellow fever and the occurrence of urban epidemics from this source upset our ideas very much 3 years ago. However, as Soper has

pointed out, for all practical purposes of quarantine and control, measures against the *Aëdes aegypti* have proved sufficient and probably will suffice in the future. The discovery, however, furnishes much food for thought and makes us realize more than ever the rôle which insects have played in the past and now play in the transmission of diseases.

We have several times pointed out the apprehension which exists over the possible spread of yellow fever to countries like Egypt and Asia, the new factor in this case being the tremendous increase in travel by airplanes. It is evident that once again must we revise not only our ideas but to a certain extent our methods in the control of certain diseases. We have felt sure that yellow fever would never again gain a foothold on the North American continent. We can still hold to this belief with a large degree of confidence, the more so since heretofore possible and unsuspected dangers have been detected and can be guarded against.

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APPRAISING LOCAL HEALTH WORK

THE publication of the *Appraisal Form for Local Health Work* by the American Public Health Association [1] adds another contribution to the impressive list made by the Committee on Administrative Practice and indicates further advance in the development of appraisal methods. It is noteworthy that public health programs of rural counties have progressed sufficiently to cause the committee to prepare a single Appraisal Form to be applied, with some adaptation, in both rural and urban areas. This Form combines selected features of the *Appraisal Form for City Health Work,* first printed in 1925, and the *Appraisal Form for Rural Health Work* later issued in 1927, and includes revisions and additions of new indices in line with tested experiences.

Surveys of health conditions were undertaken in England nearly a hundred years ago, Chadwick's report in 1842 on "Sanitary Conditions of the Labouring Population of Great Britain" being well known. The first sanitary survey in the United States was made by the Massachusetts Sanitary Commission, headed by Lemuel Shattuck, in 1849.[2] Probably the first step toward the development of local health appraisal methods was the preparation in 1875 of a List of Questions relating to the sanitary condition of a city or town, by a committee of the American Public Health Association. The Chairman, John S. Billings, M.D., explained the purpose as follows: "These questions are intended to obtain, as far as possible, the information which would be desired in estimating the healthfulness of a given place, and to ascertain the local and especially the preventable cause of disease at that point. Facts and not opinions are desired, and the questions are drawn up in that point of view." [3] While quite complete for stock taking of sanitation facilities and procedures, these questions naturally omitted many of the features now recognized as of primary importance in a modern public health program.

A new era in community studies began in the early years of the present century. The Pittsburgh survey [4] initiated in 1907, primarily as a social and educational

undertaking, was followed by the taking of community case histories throughout the United States. Furthermore, in response to the official requests of governors and mayors for an appraisal of the health machinery which was so important a part of their respective governments, the Surgeon General of the Public Health Service assigned physicians of his staff for this purpose, with valuable results in the broadening of legal authority and the enlargement of functions of state and local boards of health.

Based on the results of extensive surveys and on group judgment of health officers and other public health workers, the Committee on Administrative Practice developed the Appraisal Form to facilitate the analysis of community health service against a background of social and health conditions. This measuring rod aims to help in determining the adequacy of public health work in relation to the magnitude and type of local problem. The Appraisal Form does not attempt to determine with finality the relative importance and proper place of all local problems. It selects certain problems which experience has shown are common in varying degree to most communities and uses the services rendered in these fields as a gauge of the health efforts of the community in a particular field. The new edition consists broadly of three parts: descriptive survey of facilities, appraisal of health activities, and selected indices of community characteristics related to health. This instrument enables a health officer or a surveyor to take account of stock periodically, and is a valuable adjunct to personal field observations.

An important contribution was also made to the survey method in 1936 through the development of objective indices of health in relation to environment and sanitation by a member of the staff of the Health Organization of the League of Nations.[5] The plan involved an attempt to formulate a series of objective data which are deemed desirable in order to arrive at a more complete and a more precise appreciation of health conditions than is ordinarily obtained. This system does not establish a unit rating, but is rather meant to indicate, describe and measure local problems. In October, 1938, the Committee on Health Indices of the League met in Geneva and revised the schedule which had been utilized for two years. The anticipated next step will be the application of the new schedule to a number of health jurisdictions in various parts of the world.

With the advancement of public health and the changing problems of society to be considered, the administrator is faced with the responsibility of analyzing community programs and of determining relative values so far as practical. Application of appraisal methods and scrutiny of health indices may assist materially in the evaluation process.

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SANITARY DISPENSING OF BEVERAGES

TWENTY years ago an article in this *Journal*[1] called attention to the dangers of contaminated glasses and dishes in the spread of respiratory diseases. Since that time, much progress has been made in the control of this hazard by appropriate legislation, by the development of chemical and physical methods of sterilization, and, more recently, by the use of ultra-violet rays having bactericidal powers.[2]

The magnitude of this problem is indicated by the continued widespread use of glasses and other eating utensils in public restaurants, soda fountains, taverns, and roadside stands. It is estimated, for example, that some four and a half billion bottles of carbonated beverages are sold annually in this country, while more than ten billion glasses of draught beer are consumed in the United States every year. Add to these figures the glasses and cups used in public places for milk, coffee, tea, fruit juices, and other beverages, including water, which is still favored by some consumers, and the total obviously reaches a staggering figure.

In addition to the problem of adequate cleansing and sterilization of the utensils that come in intimate contact with many individuals, there is also the sanitary problem of proper dispensing of various beverages from bulk containers. Despite the growth in popular favor of bottled and canned beer, for instance, draught beer over the counter still accounts for considerably more than half of the sales of this farinaceous product, and newly developed methods for cooling its containers and retaining its pleasing flavor may make this beverage even more popular.

While the old-fashioned type of loose milk has been prohibited by law in most communities, devices have been perfected for the hygienic dispensing of pasteurized milk from bulk containers in restaurants. After more than three years' study, seven such devices have been approved by the Health Department of New York City, and are being installed in public eating places at a fairly rapid rate. There is no reason why such devices should not be permitted and employed if it can be demonstrated to the satisfaction of discerning health officials that in construction and operation such devices will consistently safeguard the public health.

The essential features of such sanitary dispensing gadgets are simplicity and ease of operation. They should be made of materials that not only resist contamination and are non-toxic, but are so constructed that they may be frequently and easily disassembled and quickly and effectively cleansed or sterilized in boiling water or appropriate chemical solutions.

The formulation of standards for such devices is, of course, only a part of public health control. Adequate and reasonable enforcement by health authorities of hygienic practices in the dispensing of these billions of beverages is equally significant.[3]

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PUBLIC HEALTH EDUCATION*

"Short Words Pack a Punch"—A master writer, Gelett Burgess, under the above title, makes a plea and points the way. The writer and speaker on health should read the whole of the short article. Here are two selections:

This is a plea for the use of more short words. For through the lack of them our speech grows weak and may hold more sham than true thought. Long words are apt at times to hide or blur what one thinks; but short words say just what they mean, and do not leave you in doubt. They are clear and sharp, like signs cut on a rock.

Of course, if one has deep or strange or high, shrewd thoughts to tell, one must use long words more or less; but if you would like to say things with force, it is well to learn first to use short words as much as you can. It will make your style crisp and give it zest when you talk or write.

Friend, read the Good Book. Read the tale of Ruth, read of Saul and Lot, and all the rest, and see how wise and deep are the short crisp words of our great tongue. To be sure, the tales are not told all in words as short as those I use here, but they are all good old words that are couth and yare and there are few long ones. When they tell a tale you can see what goes on as if in a play, by the sheer spell of plain, free speech that can say what it means to a mere child and not be lost.

Short words are words of might.

In *Your Life*, 354 4th Ave., New York, N. Y. Nov., 1938. *25 cents.*

Pictures in Continuity—Not a picture to tell this, and another to tell that. But a group of pictures to tell this and this about that. Such is the practice of more and more newspaper rotogravure editors, as brought out in an article in *Editor and Publisher* (Times Bldg., New York, N. Y., Dec. 17, 1938).

One editor says:

"I don't mean . . . that every picture in our section has to be part of a continuity series. We use a good many single shots when we think we have shots that are interesting. But we are aiming at one goal, to make every picture tell a story, just as we attempt to make every block of type tell a story."

A few hospital and other annual reports have adopted this technic, but doubtless more health agencies could do the same.

Another editor emphasizes a point in handling pictures:

"In my format I have eliminated all ginger-bread cut-outs and designs around pictures, all ovals and trick make-up. I make each spread of pictures tell a story, and the photographs are laid out in simple form so that the eye will not be attracted from the picture itself."

Frequent examples of picture continuity idea will be found in *Life, Look,* and other picture magazines.

Continuity would do a lot for pictures in exhibits, but there pictures must have size as well as story. At Kansas City, we had pictures too small to tempt anyone even to look for a story.

Man in the Museum—Under this title, Dr. Bruno Gebhard, of the American Museum of Health, presented a paper before the American Museum Association.

A few selected paragraphs:

My personal feeling is, and it is based on more than ten years of very detailed experience, that a Museum on Man which is only of an explanatory type similar to most of our biological or anthropological divisions has

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22nd St., New York, N. Y.

only a very small appeal to the masses of the people. What people really want to know is "How shall we live?" . . .

Man as a living organism makes it necessary to look for special methods of presentation. Whenever it is possible, three dimensional models, animated diagrams and personal participation should be included. The personal participation may start with the invitation "please push button," instead of the old "Don't touch!" The visitor may test his own strength of the muscles, the capacity of his lungs, the absence or presence of color blindness, or the power of vision. There may be a demonstration of the beating of the visitor's own heart, its frequency and its very dramatic sound, as it has been done in the last Paris Fair. The personal participation may be very simple, but it always teaches a real lesson. It aids in fixing the message of the special item in the mind of the visitor. Personal participation is also a good remedy against museum fatigue.

We all realize how important it is to have motion in our exhibits, sometimes in combination with light such as a model of the Circulation of Blood. Animated diagrams have proved their educational value if logically related to the subject matter. Wherever we can we should visualize biological figures which we tell the public. The amount of air a person breathes through his lungs in one day can be shown by a cage made from wire hanging from the ceiling.

The Transparent Man—a life-size figure which shows by lights the location and relation of the different organs—is at present unsurpassed as a feature of the three dimensional model. . . .

More or less, we are not allowed to show Man in his body structure only. We have to demonstrate at least the function of the body. In other words, we should not have a section on "Skeleton and Muscles," but on "Walking and Working." We have to make a stronger attempt to show Man in his mental construction and in his emotional make-up. If we show the fundamentals of personal biology we should then show that nobody is in this mold by himself—that we all are only a link in a chain, that we all are born and live in families, that we have ancestors and heirs. . . .

Right or Wrong, or Which Is Which?—With all the varied forms of question and answer broadcasts, it seems a pity that health is not given its opportunity in perplexing radio audiences. Anatomy, physiology, sanitation and hygiene, and related special sciences should furnish a wealth of good material.

A file of *Hygeia* alone should provide material for several different broadcasts for several years.

To Be a Puppet Showman—There are many books on puppetry. One of the best for amateurs is "Be a Puppet Showman," by Remo Bufano. Century Co., New York, N. Y., 1933. *$2.50.* The author is a master puppeteer, and he is a sympathetic guide to the beginner. His book is easy to read, and his information is easy to use.

It is hoped that the combination of craftsmanship and showmanship offered in puppetry will lure some health workers. It is a hobby with health education possibilities.

Also we hope that several health agencies will test collaboration with school and crafts groups to enlist children and young people in puppet making with health education as a by-product.

Bufano emphasizes the long history of puppets in presenting "serious" plays. Puppet plays need not be slapstick, and they can be given with a surprising appeal to adult audiences.

Health Education in Y.W.C.A.—Major emphases for 1938–1940 are announced by National Board, Y.W.C.A., 600 Lexington Ave., New York, N. Y.

The health education program in the Association should include individual service on personal health problems; educational programs relating to health and recreation; activities that build health and develop skills in recreation and the provision of opportunities for continuing participation in these recreational activities. Responsibility for this program is shared by all groups in

the association. Such a program constitutes a legitimate cost to the association and should be so budgeted.

The emphases for the biennium will be:

a. Nutrition, relaxation and sex education.
b. Work on community health problems and coöperation with public and private health agencies.
c. The study of administrative practices in relation to program trends.

Coöperative Publication in New Jersey—Some 19 local health departments in New Jersey participate in a joint publication plan directed by John Hall, of Freehold, N. J., Executive Secretary of the New Jersey Health and Sanitary Association.

By this plan each department issues, in its own name, a 4 page illustrated bulletin five times a year. The cost is $12.50 per issue, for 500 copies; $20.00 for 1,000; $1.00 for each added 100; specially prepared pages, each $4.00 in addition.

For two years the State Department of Health has paid for three-fifths of the cost.

Doubtless, for many readers the limited size is an advantage.

"When Everyone Knows"—This is the title of the annual report of Canadian Dental Hygiene Council, 170 St. George St., Toronto, Ontario.

An organization diagram shows a wide range of coöperative effort. A variety of oral hygiene material is listed. An Ontario mouth hygiene campaign is described.

The objectives of the Council:

> When every person in Canada knows what every physician, dentist, and health worker knows—that diseased teeth are one of the most common causes of ill health, and further, when everyone knows what scientific findings declare—that diseased teeth may be prevented through proper diet, careful attention to mouth hygiene, and early operative treatment, all of which involves very little financial expenditure—*then* the Canadian Dental Hygiene Council will feel that it has fully performed its task, for this is what the council is striving to teach.

Who Wants To See Pictures?—Or, examples of charts, or interesting cover pages, etc.? We could use more of such material if our readers will send it in? See address at foot of this page in every issue of the *Journal*.

"If Any Money Is Left Over"—In "Four Years of District Health Administration in New York City," by Dr. J. L. Rice and Dr. M. W. Barnard, in *Milbank Memorial Fund Quarterly*, 40 Wall St., New York, N. Y. (July, 1938), under "Health Education":

> Of all the district services the one which is probably best suited to localization is health education. Effective teaching of health work must be based on an intimate understanding of the people to be taught. Subject matter must be adapted to many interests, traditional thought patterns and levels of intelligence. Health education seems also to be the field of public health which is least thoroughly geared into public health programs throughout the country. Too often it is the thing to be done if any money is left over. Trained personnel, tested procedures, and funds are inadequate. Four years of district experience have shown both the urgent necessity for organized health education among the people and some of the effective ways in which this can be done on a localized basis. Development of this work is one of the outstanding plans in the district program.

Check Your Shipping Department—Especially in quite large organizations the shipping of health education material by mail or otherwise is far removed from the office which lovingly, and with meticulous care, plans and prepares the posters and other publications.

Some such material received by the writer has arrived in bad shape because of careless handling in the shipping department, or through efforts to save a small fraction on the cost of the printed matter.

One practice is to mail a single poster, or a small lot of posters, rolled in a

flimsy cardboard cover which is most likely to be crushed in the mail.

Another disconcerting practice is to use a too small mailing tube into which the poster or large printed piece must be crowded by the shipping clerk, so that in some cases the tube must literally be removed in pieces if the enclosure is to be taken out whole.

Anyway, the rolling of a bundle of assorted pamphlets, broadsides, and posters gives the recipient an annoying job of getting each separate item rolled flat before it can be examined.

Again, those whose monthly bulletin or health journal is rolled for mailing might well consider if the loss of good will is a fair equivalent for the slight saving in cost.

To help make sure as to how matters go in the shipping or mailing rooms, one might order sample shipments to one's home address, as well as to the addresses of several friends.

And it may be well to bear in mind that in the course of time, with changes in personnel, shipping practices may be changed radically without official intent.

It Can Be Done — Government health education printed matter can be made to look interesting. For proof see a new folder so readable in appearance that you won't believe it came from the U.S.P.H.S. until you see the modest credit line at the foot of the last page.

"Syphilis: It's Cause—It's Spread—Its Cure," is an 8 page folder prepared to supplement efforts of physicians and clinics.

"It is clear. We tried it on patients at a city clinic, on a workers education group, on a grade school age group, on college students. We revised it until it answered their questions in a way they would understand. Then we added the pictures to help drive home the story."

"It is inexpensive. It may be secured from the Superintendent of Documents in Washington, D. C., for $1.00 per 100 copies. In smaller quantities five cents each. But give one to each patient on the occasion of his first visit and it should save many cases for many treatments."

Making a Bibliography More Useful—What is a bibliography for? How can it be made to serve the desired purpose?

These questions arise more and more frequently as we examine the reading lists included with reports and other publications.

The latest is a bibliography accompanying "Tuberculosis in Philadelphia," by A. M. Lowell, Research Secretary, Philadelphia Health Council and Tuberculosis Commission, 311 S. Juniper St.

The last 2 of 54 mimeographed pages lists articles, pamphlets, and reports:

. . . sources which will permit a more intensive study of the tuberculosis problem in Philadelphia.

Of the 24 references 11 or 12 contain Philadelphia data. The other references would help in the "intensive study" of any other city as much as in further Philadelphia studies. *Would it not have been worth while to have indicated the sources of local data?*

Without guessing who might make a further "intensive study" in Philadelphia, *would it not be helpful to have added concise annotations to point out the significance of at least some of the general references?*

DATES AHEAD

Are you preparing for a future commemoration of your department, your agency, or of some special aspect of your activities? An editorial, "Historical Data and Anniversaries," in *Hospitals* (Am. Hos. Assn., 18 E. Division St., Chicago, Ill., Jan., 1939) should interest more than hospitals. Two paragraphs say:

Few hospitals preserve the data that make for historical record. A metal fire-proof

cabinet should be provided for minute books, photographs, portraits, newspaper clippings, and data referring to the contemporary activities of the hospital.

The hospital management preparing for the celebration of one of these periods should be extremely grateful to predecessors who have preserved the record of progress.

Anniversaries may be commemorated in many ways. Ample historical data; moving pictures; exhibits of hospital scenes at the time of opening; portraits of founders; setups of interesting exhibits, such as an operating room of the eighties alongside of an operating room of the present day; pathological laboratories contrasting the two periods; comparative exhibits of old and new equipment; a period exhibit of nurses' uniforms on manikins or dolls, all serve to show the advance in hospital standards.

"Social Hygiene Day" activities will be continued through February in many communities.

In March, 1877, the first visiting nurse started on her rounds.

St. Patrick's Day, March 17, need not be overlooked in writing timely health material.

And then comes Early Diagnosis Campaign, with possibilities in cooperation from most health agencies.

April 1 may prompt reminders of how easy it is to fool oneself in health matters.

FOR REFERENCE AND EDUCATION

"Dry Skim Milk," by Bureau of Home Economics, Dept. of Agriculture, Washington, D. C. *Free.*

Nursing Information Bureau, 50 W. 50 St., New York, N. Y., will send free samples of the following folders:

"Safe Nursing Care" . . . "8-Hour Day" . . . "Wanted: A Real Nurse, an R.N."

"Safety and Sanitation in Institutions of Higher Education," by Dr. James Frederick Rogers, Office of Education. Supt. of Documents, Washington, D. C. *10 cents.*

"The Truth about Cancer." A chapter to a page. Simple, clear. New York State Dept. of Health, Albany, N. Y.

WANTED

A group of graduate students listing health motion pictures and film strips. Send information to Frank J. Mayer, 140 W. Medical Bldg., Ann Arbor, Mich.

A "Guide to Information about Dental Health" is a tentative printed edition, submitted for examination and use test. Intended to carry "in condensed form information of primary importance," the 8 page folder is designed "as an aid to social workers, dental hygienists, school teachers, nurses, and community health workers." If you will join the corps of critics, ask New York Tuberculosis and Health Assn., 386 4th Ave., New York, N. Y., to send you a copy.

BOOKS AND REPORTS

Military Preventive Medicine—*By George C. Dunham, M.D. Carlisle Barracks, Pa.: Army Medical Bulletin No. 23, Medical Field Service School,* 1938. 1198 pp. Price, $2.50.

The first edition of this book appeared in 1930. The demand for a third edition is a proof of its practical success. It has also met with general favor at the hands of reviewers so that we welcome this new edition which has been revised and brought up to date, and is in every way an admirable book.

The Foreword by the Surgeon General of the Army points out that the military environment shapes the policies of practical sanitation. Measures applicable in the home or in civil communities are often found impracticable in the military service. The difficulties encountered, however, are overbalanced by the opportunity which one has in the military service for the practice of preventive medicine and sanitation and the fact that measures are generally under the control of the officer in charge and can be enforced.

Obsolete material has been deleted. Though it is written from the military standpoint, the underlying principles are the same as in civil practice, and both military and civil officers will find this volume very useful.

The arrangement of the book is excellent and each section is treated adequately. Special attention is given to nutrition. There are good sections on water purification, food control, meat inspection, inspection of poultry, eggs, and fish, dairy and milk plant sanitation, mess sanitation, waste disposal, sewage treatment, etc. It goes without saying that the control of insect-borne diseases is prominent. We owe much to the officers of the Army for what they have taught us concerning insect-borne diseases. There is also a chapter on Vital Statistics which seems adequate for the purpose. There are six appendices which give the caloric value of human foods, foods which are sources of protein and mineral elements and vitamins, and score cards for dairy farms, pasteurization and milk plants.

The author holds that yaws is quite similar to syphilis, responding positively to the Wassermann and Kahn reactions. He regards alastrim as probably an aberrant form of smallpox.

The book is excellently gotten up and well printed. It is abundantly illustrated with some colored charts, notable among which is one of the reactions of smallpox vaccination which was obtained from the Commissioner of Health of Baltimore, Md. Altogether the book can be recommended unreservedly. The remarkably low price at which it is sold is due to its being an *Army Medical Bulletin* published under the authority of the Secretary of War.

MAZÝCK P. RAVENEL

Introduction To Motherhood—*By Edwin F. Patton, A.B., M.D. South Pasadena, Calif.: Commercial Textbook Co., Ltd.,* 1938. 137 pp. Price, $1.50.

It is recognized generally that maternal and infant hygiene depend to a considerable extent upon prenatal care and instruction. Dr. Patton in this little textbook carries the educational process a step or two backward to the adolescent and preadolescent periods where first serious questions are being raised about sex and its relation to motherhood and fatherhood. While this

book is designed to fill a need for suitable instruction in junior and senior high schools, it might well be used, as Dr. Patton suggests, by progressive mothers in introducing their preadolescent daughters to sound ideas of motherhood.

The book is written in an easy colloquial style using words that have an exact meaning. No attempt is made to camouflage the meaning with artistic, dramatic, or puerile phrases. The chapter on "The Child" contains helpful suggestions on child hygiene. Each chapter is followed by a review questionnaire which will assist in fixing the most important points in mind. A glossary of terms completes the text.

RICHARD A. BOLT

Estuary of the River Mersey. *The Effect of the Discharge of Crude Sewage into the Estuary of the River Mersey on the Amount and Hardness of the Deposit in the Estuary. Water Pollution Research Technical Paper No. 7. Department of Scientific and Industrial Research. London, England: His Majesty's Stationery Office,* 1938. 337 pp. Price, $8.00.

The effect of the discharge of large volumes of untreated sewage on the deposition of solid matter in the Estuary of the River Mersey (England) has been a matter of controversy among the local interests for many years. In 1932, the interested authorities invited the Department of Scientific and Industrial Research to undertake an investigation to determine the effect of such discharges "on the amount and hardness of the deposit in the Estuary." Among other things to which the referring authorities agreed was that "on the issues of scientific facts the results of the investigation should be accepted as conclusive."

The investigation took about 4 years and was necessarily concerned with careful studies of the discharges into and their distribution within the Estuary; mud sources, composition and deposits; sedimentation rates of mud and mixtures of mud and sewage; the effect of stirring on aggregation and sedimentation; erosion and dredging; and physical changes in estuary channels and banks.

The conclusion of the work and study was that crude sewage discharges had no appreciable effect on the amount and hardness of the deposits in the Estuary.

ARTHUR P. MILLER

A Textbook of Bacteriology—*By Thurman B. Rice, A.M., M.D. (2nd ed.) Philadelphia and London: Saunders,* 1938. 563 pp. Price, $5.00.

This book contains 58 chapters, 5 appendices, an index, but no bibliography. In the preface the author states his feeling that the success of the first edition in two years has demonstrated that the medical student needs a relatively simple text that he may be expected to master in one semester, and revision has aimed merely to bring up to date, clarify, and correct certain passages. A bibliography has been rejected on the premise that students do not read references unless specially assigned by an instructor.

The author has largely omitted theoretical discussions of controversial subjects. The technical processes described in detail are only those which may be carried on by the practising physician, and more complete instructions than is usual in such textbooks are given for taking specimens, sending them to a laboratory, and interpreting the results obtained. The point of view of the author is better understood when it is known that he has been the director of a central state health department laboratory.

It is apparent that the author throughout is writing a reference book for the physician who wishes a short and non-technical review of bacteri-

ology; consequently the book differs greatly from most of the well known textbooks of bacteriology. It is written in a style that might be expected from a physician, author, and teacher who has a penchant for putting scientific facts into popular language. Certainly the presentation is original. While the book seems excellently suited for use by the medical student and the practising physician in the manner that "pleasure reading" is now assigned to pupils in our high schools, its use as a textbook would need to be supplemented by a very complete lecture course.

Morphological descriptions are brief. Bergey's classification is used rather consistently. Technical terms are concisely but, on the whole, rather well defined. There are some inaccuracies in the book. Perhaps too much emphasis is given to disinfection and there is altogether too much use of trade names. The many simple yet illustrative drawings and the somewhat unusual photographs add to the value of the book and differ from those so frequently seen in other textbooks. Many practising physicians would find this book useful for frequent reference.

FRIEND LEE MICKLE

The Bacteriological Examination of Water Supplies. *Report on Public Health and Medical Subjects No. 71. Ministry of Health. London, England: His Majesty's Stationery Office,* 1937. 38 pp.

This monograph was prepared by a committee of eight whose names separately and collectively command the respect of American workers in the field of water bacteriology. The object is to prescribe a standard procedure. The recommended examinations include plate counts at 20°C. and 37°C. and a coli-aerogenes count. Directions are also included for detection of fecal streptococci, *Cl. welchii* and bacteria of the typhoid-paratyphoid group. While much of the technic differs little from that in use in the United States, the recommended media for the 37°C. plate count and for the coliform group are those of MacConkey. The essential difference is in the use of commercial sodium taurocholate in place of meat extract.

Appendices contain details in regard to sampling, apparatus, the preparation of media and reagents, and McCrady's table for the probable number of coliform organisms present in water.

The monograph includes a very concise and excellent statement of the interpretation of the laboratory results with which it is believed that most American workers would heartily agree.

JOHN F. NORTON

A General Textbook of Nursing —*By Evelyn C. Pearce. New York: Dutton,* 1938. 888 pp. Price, $3.75.

The author has again written from her broad personal experience in the care of the sick and in the teaching of nurses. While the book is entitled "A General Textbook of Nursing," it is planned as a comprehensive guide and it is just that. The volume is divided into six sections, presenting: (1) General and Special Nursing Measures and Procedures; (2) The Feeding of Adult Patients and Infants and Elementary Dietetics; (3) The Administration of Drugs and Medicines and Elementary Materia Medica, Poisons and Poisoning; (4) Medical Conditions and Diseases and their Treatment and Nursing; (5) Gynecological Conditions and Their Treatment and Nursing Care, Venereal Disease, A Short Account of Pregnancy; (6) Surgical Nursing and Elementary Surgical Technique.

While nursing procedures must vary according to the practices of the chiefs of staffs and hospital routines, Miss Pearce presents those phases of nursing care which are fundamental and prac-

tical and are particularly helpful to the inexperienced nurse in stating what she may expect to find, how the patients may react, and what is the nurse's responsibility.

The volume is richly illustrated with carefully marked photographs and drawings. The appendix gives some examples of the type of questions used in the final "state examinations" of the last few years and this, no doubt, indicates one of the chief uses for which the book was written. Throughout this very comprehensive presentation one has the conviction that the patient's comfort and recovery are always foremost in the nurse's mind and practice.

While this volume does not easily lend itself for use as a textbook, it is recommended as a reference book for schools of nursing libraries and for nurses in general practice who do not have good library facilities.

MARION G. HOWELL

A Textbook of Biochemistry—*By Roger J. Williams, Ph.D., D.Sc. New York: Van Nostrand,* 1938. 525 pp. Price, $6.00.

Dr. Williams has written a short textbook of biochemistry, which presents the material in a manner somewhat different from most texts which have appeared recently. The order of presentation of the subject is obviously responsible for the novel features.

The book is divided into five parts. The first three sections concern respectively Biochemical Materials (largely colloid and organic chemistry, presented briefly), Tissue Composition and Food Composition. The last two which may be considered as the physiological applications, are respectively Bodily Mechanisms for Regulating Chemical Change, and Metabolism.

This is not a completely new method of approach. About 15 years ago, before medical students were advised to receive didactic instruction in elementary organic and physical chemistry in their pre-medical training, it was the favorite method of presenting the subject with some teachers. The duration of the course in biochemistry in medical schools was somewhat longer under those circumstances than it is now. At present it appears desirable to spend by far the larger proportion of time upon the physiological applications of chemistry.

The reviewer believes that the text, which is a worthy one, will have greater usefulness for courses in biochemistry designed for other than medical students.

D. L. DRABKIN

Nurses Handbook of Obstetrics—*By Louise Zabriskie, R.N. (5th ed.) Philadelphia: Lippincott,* 1937. 724 pp. Price, $3.00.

The fifth edition of Miss Zabriskie's Handbook measures up to all expectations derived from the previous editions. It is difficult to conceive of a more comprehensive or complete guide for nurses in this important field. The selection and arrangement of material, the excellent illustrations, the handy glossary, references, and complete index, make it a valuable reference volume. Especial attention has been given to the photographic illustrations.

The public health implications of good obstetrics have not been overlooked. A chapter is devoted to antenatal care which includes not only the part played by the medical attendant but also the nurse's share in suitable instruction through personal conference and well organized classes for group instruction of prospective mothers and fathers. The chapter on Motherhood and Human Welfare is timely in view of the developments taking place in governmental extension of maternal and child hygiene. A brief chapter on the History of Obstetrics adds to the value of the Handbook.

RICHARD A. BOLT

Tuberculosis Clinic Manual—*A Report of the Committee on Clinic Standards. By Herbert R. Edwards, M.D., Chairman. New York: National Tuberculosis Association,* 1938. 57 pp. Price, $.50.

In this small volume the Committee on Clinic Standards of the National Tuberculosis Association has put into concise form the component parts of desirable tuberculosis clinic practice as it is understood in progressive tuberculosis work in this country. Beginning with a historical introduction, the committee has defined, in the modern sense, the function and service of the clinic. It has discussed relationships with other agencies, responsibility, budgetary items, physical arrangement of the clinic quarters, the admission of patients, their records, standards of personnel, scope of medical services and clinic procedures, educational activities relating to clinic work, case finding methods, and standards of tuberculosis service.

Especially interesting are the short chapters on Responsible Agency, Relationships with Other Agencies, and Educational Activities. According to the committee "The voluntary agency has contributed much to the development of clinic services in this country. It is its responsibility to initiate and demonstrate clinic service in a community without such facilities, or even to supplement existing clinics by additional facilities in new areas. It is likewise the responsibility of the voluntary agency to bend every effort to cause the official agency to assume responsibility for such clinic service as soon as possible."

More extensive affiliation with medical schools is urged, it being pointed out that less than one-half of the 77 recognized medical schools in the United States in 1936 had an affiliation with a chest clinic.

The chapter on relationships with other units of community health and welfare work discusses coöperation and correlation of clinic service with the private practitioner, the hospital and sanatorium, the relief agency, and the local nursing agency.

A comprehensive account is given on the management of clinic records and on the scope of medical services and clinic procedures. Diagnosis and supervision of the case have a prominent part in the description of service in the clinic.

The volume contains a bibliography of selected references on tuberculosis dispensaries. An appendix on the arrangement of clinic space includes two diagrams showing, respectively, the layout of a chest service in a health center building in New York City, and the layout of space in a store or loft adapted for clinic use.

This excellent manual may be used to great advantage in setting up a new clinic and in evaluating existing tuberculosis clinic services. Although the committee concludes that "such standards of practice as we may devise are at best suggestive and are bound to be altered by the varying circumstances met in an individual community," clinic chiefs and their coworkers will find this volume extremely useful. Witnessing the greater emphasis on the refinement of case finding methods in the tuberculosis program, tuberculosis workers everywhere should become acquainted with this comprehensive report. BERNARD S. COLEMAN

The Road To Safety Series—*By Horace Mann Buckley, Margaret L. White, Alice B. Adams, and Leslie R. Silvernale. New York: American Book Co.,* 1938.

The Series includes eight volumes, as follows: *Away We Go,* 56 pp., price $.20; *Happy Times,* 137 pp., price $.56; *In Storm and Sunshine,* 152 pp., price $.64; *In Town and Country,* 216

pp., price $.72; *Here and There,* 285 pp., price $.72; *Around the Year,* 346 pp., price $.76; *On Land and Water,* 357 pp., price $.80; *Who Travels There?* 440 pp., price $.88.

This is a series of 8 volumes dealing with the subject of safety. They range from a small paper covered booklet called "Away We Go" intended for the use of the child just entering school to the more imposing book of 440 pages for the older child and called "Who Travels There?" The vocabularies are graded of course to fit the various age levels; there are word lists and the illustrations are profuse and attractive.

Glancing over the various volumes one sees that about every conceivable situation which may menace life and limb is treated by means of illustrative stories (interesting ones, too or simple, well written articles. Several of the books contain a list of safety habits and attitudes with references to the pages illustrating them.

It would seem to this reviewer that every boy and girl might find in this series of books most everything needed about the dangers which beset even the wariest individual in this complicated life we must lead; and that the teacher will find here ample material for use in safety instruction.

MERRILL E. CHAMPION

Manual for Dental Technicians. Vulcanite—*By J. A. Salzmann, D.D.S. New York: Pitman Publishing Corp.,* 1938. 346 pp. Price, $4.00.

This is a valuable addition to the library for dental laboratory workers. The entire field of vulcanite denture construction is covered in a manner even more determined than that pursued in the prosthetic laboratories of dental schools.

The training of technicians has usually been by the apprentice method or in commercial schools of doubtful merit. While dental education has been brought to a high level under the auspices of universities and the American Dental Association, the formal training of technicians has been neglected, hence this *Manual* would seem to fill a long felt want. It is interesting to note that courses of instruction in this field are now offered in vocational high schools of New York City.

There are a few errors, such as the transposition of figures 32 and 33 on page 26. Illustrations are numerous and helpful. The binding will stand a good deal of the rough treatment a laboratory manual must endure. The printing, arrangement of material, and make-up are of the best, and the book can be unreservedly recommended.

C. F. ELZEA

Office International D'Hygiene Publique, *Monthly Bulletin,* September, 1938.

This number is of great interest as again showing the increasing recognition of the constantly growing importance of the airplane as a possible carrier of infection.

It contains reports on the index of the *Aëdes aegypti* in the various parts of Africa, a larval index in the centers of the Côte de l'Or, of Nigeria, and index of the *Aëdes aegypti* in Kenya; also the distribution and incidence of the *Aëdes aegypti* in the Anglo-egyptien Soudan, all by well known experts. There is a description of the sanitary provisions of the Aerodrome of Lokandu (Congo belge); also articles on the precautions taken in flights of airplanes from the standpoint of carrying yellow fever, and the automatic destruction of mosquitoes in airplanes in Africa.

From America we have articles on the organization of anti-yellow fever vaccination for the personnel of the airplane companies, and among the officers of the Public Health Service of the United States; immunization of

the operatives of the air lines against yellow fever; and a report on the hiding places of mosquitoes in airplanes.

All of these articles are useful and interesting. The article by Dr. Ross, the Chief Medical Officer of Health in the Department of Hygiene in the Union of South Africa, gives a complete exposition of the dangers of carrying yellow fever in South Africa by aerial navigation. One cannot but be amused at his statement that an "almost despairing" (presque désespérée) note is contained in a recent American report which held that it was almost certain that sooner or later infected passengers will reach by means of airplanes cities infected by *Aëdes aegypti* in the southern part of the United States. It points out also that in the United States we no longer harbor the illusion of freeing the county entirely of the Aedes and are now devoting most attention to developing efficient means of ridding airplanes and airports of this mosquito.

MAZŸCK P. RAVENEL

Manual of Psychiatry and Mental Hygiene—*By Aaron J. Rosanoff, M.D. (7th ed.) New York: Wiley,* 1938. 1,091 pp. Price, $7.50.

Dr. Rosanoff's book is rewritten and enlarged in an attempt to bring the manual up to date. It is a diligent work with generous excerpts from other authors and research men in the field—in fact sometimes too voluminous to preserve congruity. In presenting his subject, the author's view is one that regards psychiatry as psychobiological reactions of the individual to his environment. It is somewhat regrettable that this fact, together with his own work and interest, restricts his scope and confines his survey of literature mostly to those topics in which he himself is most interested or engaged. In such a complex and diversified field of psychiatry, this method limits the objective representation of facts known and aimed at, and impairs the thoroughness of the book, when names and works as divergent as those of Kretschmer and Jung are entirely omitted.

The chapter on Chaotic Sexuality is rather arbitrary with inclusion of some of the so-called schizophrenic psychoses. His division of schizophrenia into five etiological entities lacks justifiable foundation. The review of psychoanalysis is rather inadequate without depth and critical evaluation. The author's comments are mostly introductory, presenting Freud in the latter's own very abbreviated paragraphs, faced with excerpts of H. T. Hyman's solitary article, "The Value of Psychoanalysis as a Psychotherapeutic Procedure," published in the *Journal of the American Medical Association* in 1933.

"Today no individual worker can write a textbook of psychiatry on the basis of his own experience alone, no matter how extensive that experience might be," writes Dr. Rosanoff. He might have done better to invite as coauthors for individual chapters in his work some of those on whose works part of his manual is based, with him acting as a coördinator and editor, moulding the parts to shape and form to give to medical students a more lucid, impartial and adequate presentation of the state and problems of psychiatry.

RALPH S. BANAY

Maternal Care Complications—*By F. L. Adair, M.D., Editor. Chicago: University of Chicago Press,* 1938. 95 pp. Price, cloth $1.00, paper $.50.

Dr. Adair and his associates have brought together the essentials in the prevention of the most important complications of pregnancy; namely the toxemias of pregnancy, obstetric hemorrhages, and puerperal infection. The same technics advised for the prevention of these complications will undoubtedly reduce the incidence of the

lesser complications and diminish the morbidity as well as the mortality.

Each chapter is devoted to one of the complications and takes up systematically the etiology, pathology, symptoms, diagnosis, and treatment. The preventability in each instance is stressed. In referring to puerperal infection, the leading cause of puerperal mortality, the authors state: "the disease is almost completely preventable in properly conducted obstetric cases."

The authors recognize the value of suitable instruction of the prospective mother as stated in the following: "Women must be properly instructed in personal care and must be taught to coöperate with and appreciate the doctor who is trying to give good antepartum and delivery care. Failure of proper lay coöperation is responsible for about 50 per cent of the preventable deaths among mothers."

While the authors recognize that the problem of reducing maternal mortality is complex, they have nevertheless indicated in this little volume the fundamental factors. RICHARD A. BOLT

BOOKS RECEIVED

DISEASES OF THE SKIN. By George Clinton Andrews. 2d ed. Philadelphia: Saunders, 1938. 899 pp. Price, $10.00.

MANUAL OF PUBLIC HEALTH HYGIENE. By J. R. Currie. Baltimore: Wood, 1938. 324 pp. Price, $5.00.

AVIAN TUBERCULOSIS INFECTIONS. By William H. Feldman. Baltimore: Williams & Wilkins, 1938. 483 pp. Price, $7.00.

NAZI GERMANY: ITS WOMEN AND FAMILY LIFE. By Clifford Kirkpatrick. Indianapolis: Bobbs Merrill, 1938. 353 pp. Price, $3.00.

NUTRITION: THE NEWER DIAGNOSTIC METHODS. Proceedings of the Round Table on Nutrition and Public Health, Sixteenth Annual Conference of the Milbank Memorial Fund, March 29–31, 1938. New York: Milbank Memorial Fund, 1938. 192 pp. Price, $1.00.

FACTS ABOUT FOOD. By S. Henning Belfrage. New York: Oxford, 1938. 177 pp. Price, $1.50.

MEDICAL INFORMATION FOR SOCIAL WORKERS. By William M. Champion. Baltimore: Wood, 1938. 529 pp. Price, $4.00.

BABY CARE. By May E. Law. Philadelphia: Lippincott, 1939. Thirteen booklets. Price, $2.00.

THE FIELD UNIT IN LOCAL PUBLIC HEALTH SERVICE. Tennessee and Mississippi, 1930–1937. By Harry E. Hanley. New York: Commonwealth Fund, 1938. 50 pp. Price, $.25.

YOUR COMMUNITY. ITS PROVISION FOR HEALTH, EDUCATION, SAFETY, AND WELFARE. By Joanna C. Colcord. New York: Russell Sage, 1939. 249 pp. Price, $.85.

VETERINARY HELMINTHOLOGY AND ENTOMOLOGY. The Diseases of Domesticated Animals Caused by Helminth and Arthropod Parasites. By H. O. Mönnig. 2d ed. Baltimore: Wood, 1938. 409 pp. Price, $9.00.

IMMUNITY. PRINCIPLES AND APPLICATION IN MEDICINE AND PUBLIC HEALTH. By Hans Zinsser, John F. Enders and LeRoy D. Fothergill. 5th edition of "Resistance to Infectious Diseases." New York: Macmillan, 1939. 801 pp. Price, $6.50.

THE CHEMISTRY OF NATURAL IMMUNITY. By William Frederick Koche. Boston: Christopher Publishing House, 1938. 199 pp. Price, $2.00.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

In the Interest of Patience—Sanitarians who are tempted to be impatient with progress hereabouts will do well to look up this editorial account of the recent British milk bill, which treats pasteurization as if it were a dangerous experiment. Under the proposed law's "revolutionary" provisions, a local health authority *may* apply to the Minister of Health for an order which will permit him to require certain kinds of milk to be pasteurized, but there must be a public inquiry in each instance, and the loopholes that the law creates are big enough to allow all the milk carts in England to be driven through. Considering the reported sanitary condition of much of the English milk, the yeomanry of those tight little Isles seem in no danger of being deprived of their daily allotment of milk-carried germs.

ANON. Half-Hearted Pasteurization. Lancet. 2, 23:1304 (Dec. 3), 1938.

Important Committee Report—Here, along with what is known, are listed a few of the researches that should be carried on to give us some needed supplementary information about cancer. The amount of work to be done seems appalling.

Anon. Fundamental Cancer Research. Pub. Health Rep. 53, 48:2121 (Dec. 2), 1938.

About Mental Health—Two brief but stimulating papers upon a subject with which many health workers are woefully uninformed. As this reviewer is about the "woefullest," this annotation must be limited to the comment that both seem well worth serious study.

HOULOOSE, J. Contribution of Mental Hygiene to Education on the Elementary Level, and:

ANDERSON, F. N. Some Physiologic Concepts in Mental Hygiene. J.A.M.A. 111, 27:2447 (Dec. 31), 1938.

Idea's Germ—Here is a discussion device which is worthy of the consideration of public health educators and other health workers. The subtitles tell the significant story: "As it is—as it should be—on the elementary school level; as it is—as it should be—on the junior high school level; as it is—as it should be—on senior high school level."

BURKHARDT, C. H., *et al.* A Symposium on Physical Education. J. Health & Phys. Ed. 9, 10:608 (Dec.), 1938.

Summer Camps, Open Air Schools, etc.—How complete has been the change in our beliefs about tuberculosis during the last dozen years is told in a few paragraphs by this author, who proceeds to pull the shaky props from under some ineffective, but emotionally satisfying so-called antituberculosis projects that, the author hints, have handicapped the real work for a generation.

BUSH, C. Tuberculosis among Children of School Age. J. School Health. 8, 9:267 (Nov.), 1938.

May School Children Spread Tuberculosis?—Primary tuberculosis infection in children runs a course comparable to other acute infections though usually with unrecognized signs. About

10 per cent of cases of childhood infection will become ill with tuberculosis in adult years after reinfection. Children with first infection disease are a danger to their playmates for only the first few months, and then not seriously so, and special treatment is not needed for primary infection. Avoidance of contact is the only preventive.

HILL, L. F. Some Present Concepts of Tuberculosis among Infants and Children. J. School Health. 8, 9:249 (Nov.), 1938.

Modifying Measles—Convalescent serum given to measles patients after Koplick spots had appeared, but while in the preëruptive stage, definitely modified the disease in about 5 cases out of 6. Normal adult serum did not help. This therapy is recommended for debilitated children, those recently recovered from whooping cough, or those with a chronic disease.

KOHN, J. L., *et al.* Treatment of Preeruptive Measles with Convalescent Serum. J.A.M.A. 111, 26:2361 (Dec. 24), 1938.

Why Scientific Answers Are Hard to Get—In New York City a group of 1,830 children of tuberculous parents have been kept under supervision, 880 of whom had received BCG. They were visited monthly by nurses and at frequent intervals by pediatricians, and an attempt was made to see that all received the same care. This paper has to do with the considerations that might affect the result, such as selection of cases for treatment and control, risk of heavy infection, race, reliability of diagnoses at death, etc. The results are not given in this paper, for the data are as yet insufficient for judgment.

LEVINE, M. L., *et al.* Immunization against Tuberculosis. Am. Rev. Tuberc. 37, 5:632 (Nov.), 1938.

Negro Diets—Health workers who write learned articles on good nutrition will be interested in this account of what negroes in Harlem actually eat. Flour, rice, and potatoes are the usual fare. Fresh vegetables and fruit are rare, but milk is the food most neglected. It is regarded as a dainty.

OPPENHEIM, D. A. An Inquiry into the Dietary of a Negro Group. Woman's Med. J. 45, 12:360 (Dec.), 1938.

Facts about Germs You Probably Never Knew—Soap and water scrubbing removes germs from the skin at a constant logarithmic rate of roughly half in 6 minutes. Theoretically it would require 2½ hours of continuous scrubbing to sterilize the skin. There is here a great deal of important information about transient and resident bacteria and other general facts that clinicians, public health nurses, and technicians especially should know.

PRICE, P. B. The Bacteriology of Normal Skin; A New Quantitative Test Applied to a Study of Bacterial Flora and the Disinfectant Action of Mechanical Cleansing. J. Infect. Dis. 63, 3:301 (Nov.–Dec.), 1938 (or) PRICE, P. B. New Studies in Surgical Bacteriology and Surgical Technic. J.A.M.A. 111, 22. 1993 (Nov. 26), 1938.

Fear, Anxiety, Ignorance, and Childbirth—Why women worry during the antenatal period and what worry does to childbirth is told to a British Association of Midwife Supervisors. Mental hygiene is an important aspect of prenatal care.

READ, G. D. Antenatal Care of the Emotions. Health Officer. 3, 7–8:184 (Nov.–Dec.), 1938.

Pneumonia Prevention—Although treatment with the capsular substance of pneumococci will render the individual partially immune to infection, and although vaccination is a practical procedure in camps and institutions where men are in close contact, especially in the face of institutional epidemics, this method of protection

does not seem feasible as a public preventive measure, because the general incidence of the disease is so low. Treatment is justified for groups in which the risk is high. Education to urge precautions by those with colds, and efforts to prevent overcrowding are worth while public measures, for pneumonias are transmitted by carriers through close personal contact.

SMILLIE, W. G. The Prevention of Pneumonia. New York State J. Med. 38, 23: 1485 (Dec. 1), 1938.

Where To Go for Board Members—Kiwanis clubs' support of community health projects are reviewed for the benefit of the (health administrator) "feller that needs a friend."

SUTTON, W. M. Public Health Programs in Kiwanis. Pub. Health Nurs. 30, 12:693 (Dec.), 1938.

Why Epidemics Spread—Old and favorite is the epidemiologic theory that disease outbreaks are produced by the increase in virulence of the causative organism, and that the epidemics end when most of the susceptibles are dead or recovered and the organism returns to its former state of virulence. Some animal experiments are reported upon, which indicate that when susceptible races become infected, nearly all succomb, when immune types meet the same hazard, they are immune, and that in mixed populations, the severity of the epidemic depends upon the proportion of susceptibles, and with few exceptions they are the only ones involved. Mice are not men, but experimentally developed theories fit human epidemiology better than the older belief in an enhanced virulence of the germ. A stimulating paper.

WEBSTER, L. T. Inborn Resistance to Infectious Disease. Sci. Month. 48, 1:69 (Jan.), 1939.

Brass Tacks and Syphilis—Here is real meat. Some venereal disease social workers discuss the technics of dealing with venereal disease contacts and how to get them to be examined. A page of this is worth chapters of theorizing about venereal disease control.

WOODS, H. E., *et al.* The Syphilitic Patient and His Contacts. Pub. Health News (New Jersey State Dept. of Health). 22, 6:386 (Dec.), 1938.

ASSOCIATION NEWS

SIXTY-EIGHTH ANNUAL MEETING

Pittsburgh, Pa.

October 17–20, 1939

HEADQUARTERS — HOTEL WILLIAM PENN

OFFICERS AND EXECUTIVE COMMITTEE

PITTSBURGH ANNUAL MEETING

DR. I. Hope Alexander, Chairman of the Local Committee for the Sixty-eighth Annual Meeting of the Association in Pittsburgh, Pa., October 17–20, announces the following Committee appointments:

I. Hope Alexander, M.D. ..... Chairman
Director, Department of Public Health

W. W. McFarland, M.D. ..... Co-Chairman
Executive Director, General Health Council

H. B. Meller, Sc.D. ..... Vice-Chairman
Bureau Chief, Bureau of Smoke Regulation

H. F. Smyth, Jr., Ph.D. ..... Secretary
Mellon Institute of Industrial Research

P. E. Marks, M.D. ..... Treasurer
Superintendent, Bureau of Infectious Diseases

Chairmen

John R. Conover, M.D. ..... Finance Committee
Frick Building

H. T. Price, M.D., President-elect ..... Reception Committee
Allegheny County Medical Society

L. W. Bass, Ph.D., Assistant Director ..... Publicity and Radio Committee
Mellon Institute of Industrial Research

H. J. Benz, M.D., Superintendent ..... Meeting Rooms Committee
Bureau of Child Welfare

Mrs. P. Burgin Digby, President ..... Registration Committee
Pennsylvania Parent-Teacher Association

L. M. Sandston, Superintendent-Engineer ..... Scientific Trips Committee
Bureau of Sanitation

S. R. Haythorn, M.D. ..... Entertainment Committee
Singer Memorial Laboratory, Allegheny General Hospital

Mrs. David B. Ludwig, President ..... Ladies Entertainment Committee
Women's Auxiliary of Allegheny County Medical Society

C. Howard Marcy, M.D., Medical Director ..... Membership and Attendance Committee
Tuberculosis League Hospital

Howard Patton, Superintendent ..... Transportation Committee
Bureau of Food Inspection

REPORT FROM THE COMMITTEE OF THE AMERICAN PUBLIC HEALTH ASSOCIATION APPOINTED TO CONFER WITH THE INTERDEPARTMENTAL COMMITTEE TO COÖRDINATE HEALTH AND WELFARE ACTIVITIES AND WITH OTHER AGENCIES, AS ADOPTED BY THE GOVERNING COUNCIL

THE committee met in Washington, D. C., on November 19, 1938, at the request of Miss Josephine Roche, Chairman of the Interdepartmental Committee, for an extended conference.

All members were present, including Abel Wolman, Dr.Eng., *Chairman*, J. N. Baker, M.D., Louis I. Dublin, Ph.D., A. T. McCormack, M.D., H. S. Mustard, M.D., J. L. Rice, M.D., F. J. Underwood, M.D., and, *ex-officio*, E. S. Godfrey, Jr., M.D., and Reginald M. Atwater, M.D.

The National Health Program was discussed from many angles but with particular reference to its bearing on the work of the public health profession and in accordance with the terms of reference of the Association Resolution dated October 27, 1938, to the end that the principles of the National Health Program may be translated promptly into effective action.

Without attempting to include all aspects of the matters discussed, the committee of the American Public Health Association presents the following statement of certain fundamental policies which it recommends to the Association for adoption as representing the considered judgment of this professional society of public health workers.

These recommendations, we believe, agree in most points substantially with the proposals of the Interdepartmental and Technical Committees on the federal-state relationships embodied in the National Health Program, and we agree that the primary federal function is to give financial and technical aid to the states for carrying out approved programs.

1. It is certainly theoretically desirable that a single state agency should be made administratively responsible for carrying out all the provisions of the National Health Program which may be enacted into law. In recommending that this single agency should be the state department of health, we recognize that the present patterns in most states do not conform to this proposal, yet we note evidence that organized medicine and many public welfare officials share our opinion that at least ultimately the state health department should be the responsible agency. We believe that there are many affirmative reasons why the state health department is the best agency at the state level for this purpose. No agency will be able so readily or effectively as the health department to provide professionally qualified personnel and be so readily or effectively able to maintain high professional standards of medical care.

In recommending that the state health department should be the primary integrating and coördinating unit, we recognize that the counsel of qualified advisers from the medical, dental, nursing, hospital, and ancillary professions will be requisite, that adequate provisions for technical staffs and administrative expense will have to be made from the outset, and that increased funds for training purposes will be essential for successful performance. We have concluded further that, however reluctant medical health officers may be at present to take over these added responsibilities, a study of the alternative choices for such purposes will be determinative. This basic recommendation does not preclude a working arrangement in some states with existing machinery outside of the official health department which might function well through another channel, provided that the state health officer retains supervisory control over the broad plans and the general purposes of the funds which the state may receive. It is further recommended that in such plans due consideration will be given to the allocation of funds by a state department of health to the various substantial governmental jurisdictions within a state where population, extent of the special problems, or financial need justify.

We note that this proposal is in accord with the recommendation of the Interdepartmental Committee that this program should be developed around and be based upon existing preventive health services.

2. The committee reaffirms and reëmphasizes the official declaration of the American Public Health Association that, in the initiation and development of the program, wide latitude should be given to the states in the definition of the population to be served, in the selection of the method of providing medical service, and in other important phases of the proposed program. We believe that similar latitude should be provided with regard to the method of raising funds in the states to accomplish approved objectives.
3. The committee finds itself in agreement with the recommendations in the National Health Program that the fundamental objectives involved here are, first, conservation of health and vitality and, second, reduction of the rôle of sickness as a cause of poverty and dependency. With this in mind, it supports the concept that Recommendations 1, 2, and 3 of the Interdepartmental Committee (the expansion of public health and maternal and child health services, the expansion of hospital, clinic, and other institutional facilities, and the provision of medical care for the medically needy) should have priority in initiation.
4. We believe that recent experience demonstrates that the Social Security Act provisions for aid to the states for health work provide a suitable framework for the expansion of preventive health services.
5. We submit that it is essential that any state program to be approved for federal aid should contain adequate provisions for the maintenance of high personnel standards and that payment of such federal aid to state agencies should be withheld when it is found that substandard services are being furnished. Similar policy should obtain with respect to state aid to local areas within a state. The appropriate federal administrative authorities should have power to establish minimum standards through rule and regulation after consultation with competent advisory professional bodies.
6. Careful study will be necessary to perfect administrative regulations to cover the details concerned with the provision of medical services, so as to assure a high level of quality. We believe that standards of medical practice should not be written into basic law. Federal aid should be conditioned on inclusion within the state plans of adequate safeguards for maintaining appropriate standards.
7. We believe that the extension and improvement of public health services in general throughout the country requires complete integration of health services of the federal government under one cabinet officer, preferably a Secretary of Health.

APPLICANTS FOR MEMBERSHIP

The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.

Health Officers Section

William S. Bailey, 31 Glorieux St., Irvington, N. J., Health Officer

Donald G. Barton, M.D., City Hall, Concord, N. H., Sanitary Officer, Dept. of Health

Herman Baxt, M.D., Riker's Island, N. Y., Chief Medical Officer, Riker's Island Penitentiary and Hospital

Joe M. Chisolm, M.D., Newport, Tenn., Cocke County Health Officer

Richard R. Foster, Soule Bldg., New Orleans, La., Director, Dept. of Public Welfare

Maurice Gore, M.D., 51 Fox St., Aurora, Ill., District State Health Superintendent

Andrew R. Johnson, Jr., State Capitol Bldg., Baton Rouge, La., Director, State Hospital Board

Edna C. Keefer, 26 Cherry St., Milford, Conn., Assistant to Health Officer

Irvin Kerlan, M.D., Boyd County Health Dept., Ashland, Ky., Assistant Director

George E. Mueller, M.D., 1011 Lake St., Oak Park, Ill., Commissioner of Health

Theodore R. Shrop, M.D., 1224 Washtenaw Ave., Ann Arbor, Mich., Chief, Division of Child Hygiene, Akron Health Dept. (Ohio) (Student at present)

Charles A. Steurer, M.D., Central Drive, Port Washington, L. I., N. Y., Director, Division of Communicable Diseases, Nassau County Dept. of Health

Laboratory Section

Guy G. Frary, State Chemical Laboratory, Vermillion, S. D., State Chemist

Ruth B. Glass, Capitol Bldg., Little Rock, Ark., Bacteriologist, State Board of Health

Ervin W. Hopkins, Ph.D., Armour & Co., Chemical Research Lab., Chicago, Ill., Research Bacteriologist

Richard J. Lebowich, M.D., 12 S. Park Drive, Gloversville, N. Y., Director, Fulton County Laboratory

Willard H. Rhodes, 933 Orizaba Ave., Long Beach, Calif., Student

Bennett Sallman, 510 N. State St., Ann Arbor, Mich., Student

Leonard O. Vose, 1017 State Capitol, Lincoln, Nebr., Director of Laboratories, State Dept. of Health

George I. Wallace, Ph.D., 362 Chemistry Bldg., Urbana, Ill., Asst. Professor of Bacteriology, University of Illinois

John N. Wilson, State Board of Health, Minneapolis, Minn., Assistant Biologist, Division of Sanitation

Vital Statistics Section

Erminie J. Cross, 231 E. 54 St., New York, N. Y., Statistical Secretary, Division of Health Studies, Commonwealth Fund

John D. B. Scott, Parliament Bldgs., Victoria, B. C., Canada, Statistician, Provincial Board of Health

Frances Sisselman, 570 Bradford St., Brooklyn, N. Y., Volunteer Worker, Henry Street Visiting Nurse Assn.

Irving V. Sollins, Ph.D., U. S. Public Health Service, Washington, D. C., Associate Statistician

Public Health Engineering Section

Henry M. Chick, District Bldg., Washington, D. C., Junior Public Health Engineer, Health Dept.

James J. Dillon, 335 State Office Bldg., Providence, R. I., Sanitary Engineer, State Dept. of Public Health

Albert M. Eldridge, Bartow County Health Dept., Cartersville, Ga., Sanitary Engineer

Samuel W. Fowler, 805 Rankin St., Greensboro, N. C., Public Health Trainee

Robert H. Gregory, Jr., Valley Health District, Luray, Va., Sanitarian, State Health Dept.

Carl D. Gross, State Health Dept., Springfield, Ill., Assistant Sanitary Engineer

John B. Harrington, 24 Washington St., S. Charleston, W. Va., Director, Division of Sanitary Engineering, State Dept. of Health

Floyd Osterhaudt, 704 West St., Carthage, N. Y., Health Inspector, Dept. of Health, New York, N. Y.

Food and Nutrition Section

Helmut C. Diehl, U. S. Frozen Pack Lab., Univ. of Wash. Campus, Seattle, Wash., Senior Chemist in Charge

James A. Heltzer, 551 Church St., Ann Arbor, Mich., Food Inspector, Health Dept.

Estelle Nesbitt, State Board of Health, Indianapolis, Ind., Director, Nutrition Division, Bureau of Maternal and Child Health

Howard C. Patton, 624 City-County Bldg., Pittsburgh, Pa., Superintendent, Bureau of Food Inspection, Dept. of Health

Rufus A. Roberts, D.V.M., 114 Greenville, LaGrange, Ga., Milk and Meat Inspector, Health Dept.

Industrial Hygiene Section

William Z. Fluck, B-1 State Office Bldg., Madison, Wis., Chemical Engineer, Industrial Hygiene Unit, State Board of Health

Child Hygiene Section

David B. Ast, D.D.S., State Office Bldg., Albany, N. Y., Assistant Director, Oral Hygiene, Division of Maternity, Infancy and Child Hygiene, State Dept. of Health

Charles S. Culotta, M.D., 388 Orange St., New Haven, Conn., Assistant Director, Child Health Conferences

E. Pearl Hannah, D.D.S., 543 Channing Ave., Palo Alto, Calif., Director, Dental Health for Public Schools

Marion C. Henderson, U. S. Dept. of Labor, Children's Bureau, Washington, D. C., Associate Statistician, Division of Statistical Research

Thomas R. O'Brien, M.D., 12 Baker St., Lynn, Mass., Director of School Health, Dept. of Health

William Schmidt, M.D., 411 E. 69 St., New York, N. Y., Director, Nutrition Study of High School Students, Coöperative Study of Cornell Medical College, U. S. Public Health Service, Department of Health and Milbank Memorial Fund

Edward J. Strick, M.D., D.Sc., 880 Forest Ave., Palo Alto, Calif., School Physician

Public Health Education Section

George P. Aitken, East Pike, Zanesville, O., Sanitarian, Muskingum County Board of Health

Alfred J. Asgis, D.D.S., 33 W. 42 St., New York, N. Y., Director, Public Health Courses, Division of General Education, New York University

Lona B. Carroll, M.D., 3785 Clements Ave., Detroit, Mich., Public Health Trainee

Harold M. Cavins, 805 Sixth St., Charleston, Ill., Assistant Professor of Hygiene, Eastern Illinois State Teachers College

Robert P. Marsh, Ph.D., 100 Broadway, Gettysburg, Pa., Professor of Biology and Hygiene, Gettysburg College

Frank J. Mayer, 520 Cherry St., Ann Arbor, Mich., Student

Hazel K. Montrose, R.N., Jacksonville, Ill., City Health Nurse

N. P. Neilson, Ph.D., 1201–16 St., N. W., Washington, D. C., Executive Secretary,

American Association for Health, Physical Education and Recreation

Fred C. Spalding, 103 Sheyenne Blvd., Valley City, N. D., Director, Dept. of Physical and Health Education, State Teachers College

Public Health Nursing Section

Nora W. Camden, 100 W. 80 St., New York, N. Y., Supervisor, Queens Center, Henry Street Visiting Nurse Service

Ina M. Collins, R.N., Harrisonville, Mo., Public Health Nurse, State Board of Health

Margaret Donnen, County Health Dept., Camden, S. C., County Nurse

Olive H. Harr, 520 S. Forest, Ann Arbor, Mich., Student

Mary A. Johnson, 424 S. E. Harvard St., Minneapolis, Minn., Field Advisory Nurse, State Dept. of Health

Mabel Madden, 118 E. 91 St., New York, N. Y., Supervisor, Henry Street Visiting Nurse Service

Frances T. McDougal, R.N., Celery Ave., Box 62, Sanford, Fla., Seminole County Nurse

Aurora S. Nelson, Hill City, Kans., Public Health Nurse, State Board of Health

Grace L. Westrope, R.N., 424 N. W. 6 St., Oklahoma City, Okla., Directing Field Nurse, Oklahoma Commission for Crippled Children

Mary L. Williams, R.N., 1317 Dreiss, Fort Worth, Tex., Tarrant County Public Health Nurse

Epidemiology Section

Malcolm H. Merrill, M.D., State Bldg., San Francisco, Calif., Chief, Bureau of Venereal Diseases, State Dept. of Public Health

Herman M. Soloway, M.D., 300½ S. Second St., Springfield, Ill., Venereal Disease Control Officer, State Dept. of Public Health

Unaffiliated

Meleta M. Harmon, 2700 W. Chicago Blvd., Detroit, Mich., Biology and Physiology Teacher, Central High School

David M. Heyman, 61 Broadway, New York, N. Y., Member, New York Board of Health

Milton C. Winternitz, M.D., 310 Cedar St., New Haven, Conn.

ANTHRAX REPORT AVAILABLE

AT the Kansas City Annual Meeting there was presented before the Industrial Hygiene Section a comprehensive report on "Anthrax in Industry," fully documented by Dr. Henry Field Smyth of Philadelphia.

In view of the limited scope of the Association Year Book, this report has been reproduced by the U. S. Public Health Service, and J. J. Bloomfield, Chairman of the Industrial Hygiene Section, announces that copies may be obtained from the Division of Industrial Hygiene, National Institute of Health, Washington, D. C.

ROYAL SANITARY INSTITUTE

THE Royal Sanitary Institute of Great Britain will meet in Scarborough, England, July 3–8, 1939.

Fellows of the Association who expect to be in England during this period are requested to notify the Executive Secretary of the A.P.H.A., 50 West 50th Street, New York, N. Y.

Letter to the Editor

To the Editor:

In your November issue, on page 1356, is a notice of the paper by J. Yerushalmy entitled "Neonatal Mortality by Order of Birth and Age of Parents," which ends with the sentence: "Conclusion jumpers will find this article much to their liking." Being already acquainted with Mr. Yerushalmy's strictly scientific paper, which is certainly of importance, I was dismayed to read this comment. May I urge your readers to consult the original and assure themselves that the author has sedulously avoided jumping to conclusions.

Very truly yours,

J. ROSSLYN EARP, DR.P.H.

December 30, 1938.

EMPLOYMENT SERVICE

The Employment Service will register persons qualified in the public health field without charge.

Replies to these advertisements, indicating clearly the key number on the envelope, should be addressed to the American Public Health Association, 50 W. 50 Street, New York, N. Y.

Positions Wanted

HEALTH OFFICERS

Experienced physician, administrator, epidemiologist and teacher, now employed, with C.P.H. from Johns Hopkins, and 14 years' public health background, will consider position. Prefers epidemiology in city or state department. Excellent references. **A355**

Well qualified physician, with C.P.H. from Johns Hopkins; experienced as school physician and in college teaching, will consider city or county administrative position or teaching and student health service. **A383**

Physician, M.D., Class A medical school; M.P.H., Harvard School of Public Health; extensive experience in pediatrics and school medical services; also background of county health administration and teaching in medical school, will consider expanded opportunity in teaching or research. **A302**

Physician, M.D., Columbia, experienced as county health officer and superintendent of health, seeks position in public health administration or medical executive work. **A396**

Physician, M.D., Vanderbilt University; Dr.P.H., Johns Hopkins; experienced as epidemiologist, health officer and professor of preventive medicine, seeks position as administrator or epidemiologist. **A397**

Physician, 30 years of age, M.D., University of Illinois; C.P.H., University of California; experienced as instructor in medicine and director of state Division of Epidemiology, desires position in communicable disease control or administration. **A399**

Physician with M.P.H. from Harvard, experienced as epidemiologist and in county health administration, also in communicable diseases at state level, seeks responsible position. **A392**

Physician, M.D., McGill; C.P.H., Johns Hopkins; excellent background of communicable disease control and school health service, seeks position as epidemiologist or public health administrator. **A368**

HEALTH EDUCATION

Young woman, experienced teacher in health education, with M.S. in Public Health and Hygiene from University of Michigan, seeks position as health coördinator. **H398**

Young man, M.S.P.H., University of Michigan; at present college teacher of hygiene and physical education, and experienced in university medical service, desires position as executive in public or private health organization. **H357**

Young woman, M.A., Health Education, Teachers College, Columbia University; with splendid international experience, seeks position as director of health education. **H369**

LABORATORY

Bacteriologist and pathologist with wide administrative experience; Ph.D., Brown University; will consider leading position in his field. **L371**

Experienced laboratory director with background of dairy products manufacture and research in control methods; University of Wisconsin, M.S. and Ph.D., desires administrative position with food manufacturing or processing industry, or association with health department doing routine and research work in food control. **L381**

MISCELLANEOUS

Experienced teacher in bacteriology and public health, Ph.D., Cornell; now professor in Grade A medical school, will consider teaching, executive or administrative position. **M327**

Dentist, graduate of Temple University, with excellent postgraduate experience, desires position in administrative aspects of dental hygiene. **M352**

Public health engineer, B.S. in Sanitary Engineering from Massachusetts Institute of Technology, experienced in Massachusetts, Connecticut and Kentucky, seeks position as sanitary or public health engineer with health department. **E380**

NEWS FROM THE FIELD

WASHINGTON NEWS LETTER ON SOCIAL LEGISLATION

PROPOSED federal legislation of interest to public health officers is covered in the *Washington News Letter on Social Legislation* which began publication in January. It will report current developments regarding proposals

To expand public health services
To provide increased health protection for mothers and babies
To construct and improve hospitals
To provide medical care for needy persons
To provide disability insurance
To establish a federal or state system of health insurance

The *News Letter* seeks to present the best opinions obtainable as to the prospects and significance of these proposals. It concerns itself more with "off the record thinking" and "behind the scenes" situations than official statements. It also covers amendments suggested by state officials and their evaluations of amendments from other sources.

The *News Letter* will be issued biweekly while Congress is in session with special editions on matters of immediate interest at a cost of $5 per subscription. For information, write Glen Leet, Editor, *Washington News Letter on Social Legislation,* 1733 Nineteenth Street, N. W., Washington, D. C.

NEW YORK PUBLIC HEALTH EDUCATION

A NEW 3 year plan for the extension of public health education work in the Health Department has been announced by Health Commissioner John L. Rice, of New York City.

Mr. Philip S. Broughton, who was connected with the recent nation-wide syphilis education campaign of the U. S. Public Health Service, has been appointed head of this project.

PUBLIC SCHOOL REPORT

EARLY in January there was submitted to the New York State Board of Regents a report on a 2 year inquiry on the public school system in New York State. A sub-committee on the School Health Program, under the Chairmanship of Professor C.-E. A. Winslow of Yale, reported that routine annual physical examinations had become so perfunctory that only glaring physical defects and common contagious diseases were usually detected. It was recommended that these examinations be abolished in favor of a new law to make thorough medical examinations compulsory for all children at only three intervals in their school careers.

In reporting that there were in existence many ill-lighted, ill-ventilated and otherwise unsanitary school buildings, the committee recommends the employment of a public health engineer under the Educational Department to counsel local school authorities on structural problems.

One portion of the report devoted to conditions in school buildings constitutes a vigorous attack on the system of ventilation now prescribed for all schools by state law, requiring all buildings to be fitted with mechanical ventilation systems capable of producing 30 cubic feet of fresh air a minute for each pupil. The committee holds that such systems are extravagantly costly, unnecessary, and even unhealthful. It was noted that the simple process of raising and lowering windows fitted with slanting boards to prevent drafts was far superior to the present plan.

In recommending that the first attempt to build a sane and thorough program of mental hygiene should originate in the state's schools, which are "the primary agency through which

modern concepts of human behavior can reach community thinking and practice," the committee reported that "teachers who would be considered by mental hygienists to have harmful effects upon children are found in abundance in the state schools."

In the section devoted to health services and examinations, the committee proposed that both physical tests and remedial work be left whenever possible to the family physicians of pupils. It held that medical inspectors now employed by schools were as a group not well qualified for their work and that the elimination of private doctors as now generally practised sapped the parents of responsibility for their children's welfare.

The practice of basing state aid to schools on attendance rather than on enrollment was reported by the committee to have caused numerous instances in which the health interests of children were sacrificed to the building up of financially profitable attendance records.

OHIO HEALTH COMMISSIONERS CONFERENCE

THE annual conference of Ohio health commissioners was recently called by Walter H. Hartung, M.D., State Director of Health. Among those who addressed the conference were: Allen W. Freeman, M.D., Professor of Public Health and Hygiene at Johns Hopkins University, Baltimore, and John A. Toomey, M.D., Associate Professor of Pediatrics, Western Reserve University School of Medicine, Cleveland.

Dr. Barney J. Hein, President of the Ohio State Medical Association, assured the conference that the medical profession supports whole-heartedly a public health program, and stressed the desirability of close and harmonious coöperation between official health workers and physicians.

U. S. HOUSING AUTHORITY ANNIVERSARY

NOVEMBER 1, 1938, marked the first anniversary of the U. S. Housing Authority.

Two hundred cities, with a total population of 33 million people, have housing authorities at the present time, and federal funds amounting to 575 million dollars have been earmarked for 142 cities.

NEW YORK CITY CONTROLS ADDITION OF CHEMICALS TO WATER SUPPLY

IN what may be the first instance in which a department of health has promulgated specific regulations concerning the addition of chemicals to a water supply for anticorrosion or anti-scaling purposes, the Board of Health of the City of New York on December 12 adopted regulations requiring a permit to be issued to persons who make a business of this work. The chemicals which may be added are limited and specified, and the amount which may be added is limited in terms of total hardness or total silica content of the water. The regulations also govern the mechanical device or apparatus constructed to regulate the chemical dosage, which must be approved by the Commissioner. There must also be provided protective means to prevent backflow or siphonage of treated water into the public water supply system. The regulations are effective April 1, 1939.

STATE LABORATORY DIRECTORS' TRANSACTIONS

THE Conference of State Laboratory Directors announces that mimeographed copies of the transactions of the Conference held at Kansas City on October 24, 1938, will shortly be available at 50 cents a copy. They may be secured from C. A. Perry, Sc.D., Secretary-Treasurer, 2411 N. Charles Street, Baltimore, Md.

NEW JERSEY HEALTH COMMITTEE

A SPECIAL committee, to be known as The New Jersey Committee on Health and Welfare, has been appointed by Governor A. Harry Moore.

This committee, the purpose of which is "to follow up and determine applications to the needs of New Jersey of certain of the considerations brought out at the Washington Conference in July," is under the chairmanship of Robert C. Clothier, LL.D., President of Rutgers University, New Brunswick, N. J.

AMERICAN CONGRESS ON OBSTETRICS

THE first American Congress devoted to a consideration of medical, nursing, and other problems associated with human reproduction will be held in the Municipal Auditorium, Cleveland, Ohio, from September 11 to 15, 1939. It will be designated as The American Congress on Obstetrics and Gynecology.

The promotion and sponsorship of the congress has been delegated to the American Committee on Maternal Welfare, Inc., which includes the following organizations in its membership:

American Association of Obstetricians, Gynecologists and Abdominal Surgeons
American College of Surgeons
American Gynecological Society
American Hospital Association
American Nurses Association
American Protestant Hospital Association
American Medical Association Section on Obstetrics and Gynecology
American Public Health Association
Central Association of Obstetricians and Gynecologists
Chicago Maternity Center
Maternity Center Association of New York
National Medical Association
National League of Nursing
National Organization for Public Health Nursing
New England Obstetrical and Gynecological Society
Pacific Coast Society of Obstetrics and Gynecology
Southern Medical Association
U. S. Bureau of the Census
U. S. Children's Bureau
U. S. Public Health Service

The purpose of this congress is to afford opportunities for discussing and publicizing the problems associated with human reproduction and the health of women and new-born babies.

The last International Congress of Obstetrics and Gynecology was held in Amsterdam, Holland, in May, 1938. Its success stimulated a desire to hold a subsequent one in five years in another European country.

MONTREAL ANTI-TUBERCULOSIS DRIVE

A TUBERCULOSIS Section in the Department of Health of Montreal, Que., has been authorized on the recommendation of Dr. Abelard Groulx, Director of the Department. The object of this new Section is to control, coördinate, and intensify the drive against tuberculosis in Montreal.

A meeting was organized by the Provincial Committee for the Prevention of Tuberculosis, in coöperation with the Department of Health, to launch the campaign. Among the speakers were Jean Gregoire, M.D., D.P.H., Deputy Minister of Health, who stated that there were at least 5,000 persons afflicted with tuberculosis at large in the Province, and stressed the necessity of an educational campaign; and A. Grant Fleming, M.D., D.P.H., Dean of the Faculty of Medicine, McGill University, who promised the support of McGill University in the present drive.

N.O.P.H.N. COMMITTEE OF FIVE

THE Executive Committee of the National Organization for Public Health Nursing, at its November meeting, appointed a Committee of Five to coöperate with the President's Interdepartmental Committee to Coördinate Health and Welfare Activities.

This committee consists of Grace Ross, Chairman, Mrs. Charles Brown, Elizabeth G. Fox, Livingston Farrand, M.D., and Dorothy Deming.

THE PRESIDENT'S MESSAGE ON HEALTH SECURITY

ON January 23, President Roosevelt transmitted to Congress a special message on health security specifically developing the subject mentioned in his annual message and commenting on the recommendations on national health prepared by the Interdepartmental Committee to Coördinate Health and Welfare Activities.

The report by Miss Josephine Roche as Chairman of the Interdepartmental Committee, attached to the President's message, points out that, though there can be no doubt that the general level of health in the United States is higher today than at any other time in the nation's history, nevertheless the evidence is equally clear that not all of the American people have shared adequately in this progress. In both rich states and in poor states there are large groups of persons for whom life is still as uncertain and as brief as if the scientific progress of the past half century had not occurred.

Specifically, the Interdepartmental Committee is now recommending to the President and to Congress four items as follows:

A. The expansion and strengthening of existing federal-state coöperative health programs under the Social Security Act through more nearly adequate grants-in-aid to the states and, through the states, to the localities.

B. Grants-in-aid to the states for the construction, enlargement, and modernization of hospitals and related facilities where these are nonexistent or inadequate but are needed, including the construction of health and diagnostic centers in areas, especially rural or sparsely populated, inaccessible to hospitals, including grants toward operating cost during the first years of such newly developed institutions to assist the states and localities in taking over responsibilities.

C. That the federal government provide grants-in-aid to the states to assist in developing programs of medical care. It is conceded that a state program of medical care should take account of the needs of all persons for whom medical services are now inadequate besides focusing on the need of those persons for whom governmental agencies have already accepted some degree of responsibility. Committee studies show that attention should also be focused on the needs of the entire population, or at least on the needs of all low income groups. The committee is of the opinion that medical services are now inadequate among self-supporting people with small incomes, as well as among needy and medically needy persons. The committee believes that choice of the groups to be served, the scope of the services furnished, and the methods used to finance the program should be made by the states, subject to conformity of the state plans with standards necessary to insure effective use of the federal grants-in-aid.

To finance the program two sources of funds could be drawn upon by the states: (a) general taxation or special tax assessments, and (b) specific insurance contributions from the potential beneficiaries of an insurance system. The committee recommends grants-in-aid to states which develop programs using either method or a combination of the two, to implement programs of medical care. The committee believes it to be of fundamental importance that a medical care program developed by a state should be a unified program applicable to all groups to be served.

D. The development of social insurance to insure partial replacement of wages during temporary or permanent disability.

A complete report of the recommendations made by the President and the Interdepartmental Committee may be found in *Document 120*, 76th Congress, First Session, House of Representatives, which is obtainable from the Superintendent of Documents, Washington, D. C.

HARVARD SYMPOSIUM ON VIRUS AND RICKETTSIAL DISEASES

THE Faculty of the Harvard School of Public Health offers a short course of lectures, clinics, and demonstrations on the virus and rickettsial diseases, with special emphasis on their public health significance, at the School during the week of June 12–17, 1939.

Lectures on the etiology, epidemiology, and methods of control of these diseases, given by members of the Faculties and by former students of the Harvard School of Public Health and of the Harvard Medical School, will occupy five mornings. Special clinics and demonstrations will be given each afternoon. In some instances these demonstrations will be continued through the week, so that all the members of the symposium can attend. On the last morning, a panel discussion will be held on the three main topics presented in the symposium.

The fee for the course will be $25.00, payable at any time up to June 12. Enrollment, however, should be arranged before June 1. Further information may be had by writing to the Secretary, School of Public Health, 55 Shattuck Street, Boston, Mass.

VITAMIN RESEARCH PRIZE OFFERED

TO promote interest in research on the water-soluble "B-complex" vitamins, Mead Johnson and Company, Evansville, Ind., has established an annual award of $1,000 to be presented over a period of five years, through the American Institute of Nutrition. A committee of members of the Institute will select the recipient, and the presentation will be made a feature of its annual spring meeting.

The award will be given to the laboratory (non-clinical) or clinical research worker in the United States or Canada who in the opinion of the judges has published during the previous calendar year the most meritorious report dealing with the B-complex vitamins. If circumstances and justice dictate, the prize may be divided among two or more persons, or it may be given to a worker for valuable contributions over an extended period, but not necessarily representative of a given year.

Nominations may be sent at any time to: Leonard A. Maynard, Ph.D., Laboratory of Animal Nutrition, Cornell University, Ithaca, N. Y. To be considered for the award at any given spring meeting, the nomination must be received by January 15.

PERSONALS

Central States

DR. MARY ALLEN, of Cleveland, Ohio, was recently appointed Staff Physician of the Bureau of Maternal and Child Health of the Wisconsin State Department of Health. She succeeds DR. RUTH A. B. BENNETT, of Galveston, Tex., who resigned.

LLOYD L. ARNOLD, A.M., M.D.,* Professor of Bacteriology and Public Health at the University of Illinois College of Medicine, and Director of the Chicago laboratories of the State Department of Health, has been appointed a member of the Chicago Board of Health, succeeding LOUIS E. SCHMIDT, M.D.,* resigned.

DR. FRANCIS A. DULAK, a member of the staff since 1934, has been appointed Secretary of the Chicago, Ill., Board of Health, following the resignation of LOUIS E. SCHMIDT, M.D.*

G. HOWARD GOWEN, M.D., PH.D.,* has resigned as Director of the Champaign-Urbana Public Health District, Champaign, Ill., to accept the position of Chief Medical Officer of the Chicago Board of Health, effective in December, 1938.

HAROLD A. WHITTAKER,* of Minneapolis, Director of the Division of

* Fellow A.P.H.A.
† Member A.P.H.A.

Sanitation, Minnesota State Department of Health, and a member of the Committee on the Hygiene of Housing of the A.P.H.A., returned in January from Geneva, Switzerland, where he attended a meeting of the Committee on Housing of the League of Nations which met in December.

Eastern States

DR. HERBERT M. GODDARD, of Philadelphia, Pa., has been appointed Assistant Director of Public Health, to succeed the late DR. ALFRED F. ALLMAN.

ROBERT M. HURSH, M.D., has been appointed Health Officer of Harrisburg, Pa., succeeding the late JOHN M. J. RAUNICK, M.D.,* who had served since 1912.

H. G. STEVENS, M.D., has been appointed Health Officer of Sherman, Conn., succeeding R. W. MUNCH.

Southern States

NORMAN G. ANGSTADT, M.D.,† of New Martinsville, W. Va., has been appointed Health Officer of Wetzel County, to succeed DR. JOHN B. HOZIER, Acting Health Officer during the past year.

DR. WILLIAM A. BEVACQUA, of Charleston, W. Va., has been appointed Health Officer of Parkersburg and Wood County, to succeed ARTHUR D. KNOTT, M.D.,* of Parkersburg, resigned.

DR. TERRY BIRD, of Tavares, Fla., has been appointed in charge of the newly created Lake County Health Unit.

FREDERICK E. DARGATZ, M.D.,† formerly of Kinsley, Kans., has been appointed Director of the health unit of Ardmore, Okla., to succeed DR. RICHARD M. PARISH.

DR. MARTIN L. FULLER has been appointed City Health Officer of Amarillo, Tex., recently separated from the Potter County Health Unit.

EARLE C. GATES, M.D., has been appointed Health Officer of the Washington-Bristol Health Department, with headquarters in Bristol, Va., He succeeds MACK I. SHANHOLTZ, M.D.,† who resigned to accept a position in Oklahoma.

DR. HENRY J. GERMANY, of Waco, was recently appointed City Health Officer of Waco, Tex., succeeding the late DR. GEORGE M. LIDDELL, who had resigned October 1.

ELINOR D. GREGG,* Director of Nursing of the U. S. Indian Service, Washington, D. C., has resigned, effective January 1.

J. H. LEVAN, C.E.,† is in charge of the *Aëdes aegypti* Control Unit, U. S. Public Health Service—with headquarters at the Miami Beach Quarantine Station—which is engaged in a Stegomyia survey and control at Key West, Fla., in coöperation with local authorities.

THOMAS PARRAN, M.D.,* Surgeon General of the U. S. Public Health Service, Washington, was awarded the William Freeman Snow Medal for outstanding service to social hygiene, at the 26th Annual Meeting of the American Social Hygiene Association in Washington, D. C., on February 1. According to the announcement, " Dr. Parran has been chosen for the award because of his great contribution to the health and happiness of the American people through his persistent efforts against syphilis and the conditions which favor its spread."

PAUL S. PARRINO, M.D.,† has been appointed Health Officer of Franklin, La., to succeed FORD S. WILLIAMS, M.D.

DR. GEORGE T. ROYSE has been appointed County Health Officer of

* Fellow A.P.H.A.
† Member A.P.H.A.

Potter County, Tex., with headquarters at Amarillo.

COL. JOSEPH F. SILER,† Director of the Army Medical School, Washington, D. C., has been awarded the Dr. George M. Kober Lectureship in recognition of his work in medical research.

FORD S. WILLIAMS, M.D.,† formerly Medical Director of St. Mary Parish Health Department, Franklin, La., has been appointed Louisiana State Director of Venereal Disease Control by the State Board of Health.

DR. REED WOLFE, of Sulphur, Okla., has been appointed Health Superintendent of Choctaw County.

Western States

J. WARREN BELL, M.D., PH.D.,* formerly Director of the Division of Maternal and Child Health of the Nebraska State Department of Health, has been appointed Medical Director of the National Society for the Prevention of Blindness, New York, N. Y.

DR. WILLIAM A. CLARKE has been appointed Health Officer of Holtville, Calif., to succeed DR. HARRY B. GRAESER.

CHARLES C. GANS, M.D.,† of Redwood City, Calif., Health Officer of the County of San Mateo, is now also Health Officer of San Mateo City, which has recently come under the county's jurisdiction. DR. JAMES A. WARBURTON has served for many years as Health Officer of the City of San Mateo.

Canada

ELIZABETH L. SMELLIE, R.N.,* Chief Superintendent of the Victorian Order of Nurses for Canada, Ottawa, Ont., was awarded the Mary Agnes Snively Memorial Medal by the Canadian Nurses Association in recognition of Miss Smellie's contribution to Canadian nurses and nursing.

Cuba

DR. DOMINGO F. RAMOS,* Secretary of Defense and Director of Public Health of Cuba, has been elected an honorary member of the American Club. This distinction has rarely been accorded either American or Cuban citizens since the Club was founded 37 years ago. The *Havana Post* reports that the Club's Board of Governor's, which elected Dr. Ramos unanimously, took into account the fact that he is regarded throughout Latin-America as the exemplification of the highest standard of ethics in his profession.

Deaths

V. H. BASSETT, M.D.,* City-County Health Officer of Savannah, Ga., died November 3, 1938.

W. J. V. DEACON, M.D.,* of East Lansing, Mich., died December 20, at the age of 70. He had been a member of the staff of the Michigan Department of Health since 1919, coming to Lansing from the Kansas State Health Department, where he was State Registrar. He had been a member of the A.P.H.A. since 1912 and was a Charter Fellow. He was Vice-Chairman of the Vital Statistics Section in 1917–1918, and Chairman in 1924.

HANS CHRISTIAN JOACHIM GRAM, whose name is known all over the world as the discoverer of the system of bacteriological staining which bears his name, died November 14, 1938. He was born in 1853, in Denmark. His professional career covered several fields. He was a laboratory worker, a pharmacologist, and head of a hospital service.

LOUIS ISRAEL HARRIS, M.D., Health Commissioner of New York, 1926–1928, died January 6, at the age of 56. He became a member of the

* Fellow A.P.H.A.
† Member A.P.H.A.

A.P.H.A. in 1915, and a Charter Fellow in 1922. He was Vice-President in 1930, a member of the Governing Council 1922–1925, and served on the Executive Board in 1929.

WILLIAM C. HUNSICKER, M.D.,† Director of the Department of Public Health of Philadelphia, Pa. and a former State Senator, died January 10, at the age of 65. Dr. Hunsicker was Professor of Urology at the Hahnemann Medical College for many years.

† Member A.P.H.A.

JOSEPH C. SAILE, M.D.,† for 32 years Health Officer of Bloomfield, N. J., and former President of the New Jersey State Health Officers Association, died January 12, at the age of 76.

WILLIAM R. TRACEY,* Chief of Vital Statistics, Dominion Bureau of Statistics, Ottawa, Canada, died January 9. He had been a member of the A.P.H.A. from 1935, and a Fellow from 1937; and was recently Vice-Chairman of the Vital Statistics Section.

CONFERENCES AND DATES

American Association for Social Security. New York, N. Y. April 7–8.

American College of Physicians—23rd Annual Session. Municipal Auditorium, New Orleans, La. March 27–31.

American Congress on Medical Education and Licensure. Palmer House, Chicago, Ill. February 13–14.

American Congress on Obstetrics and Gynecology—sponsored by the American Committee on Maternal Welfare, Inc. Municipal Auditorium, Cleveland, Ohio. September 11–15.

American Library Association. San Francisco, Calif. June 18–24.

American Orthopsychiatric Association—16th Annual Meeting, on Behavior and Its Disorders. Commodore Hotel, New York, N. Y. February 23–25.

American Medical Association, 90th Annual Meeting. St. Louis, Mo. May 15–19.

American Public Welfare Association. Buffalo, N. Y. June 20–22.

American Society of Civil Engineers—Spring Meeting: Chattanooga, Tenn., April 19–22. Summer Meeting: San Francisco, Calif., July 26–29. Fall Meeting: New York, N. Y., September 4–9.

American Water Works Association—59th Annual Meeting. Ambassador Hotel, Chelsea Hotel, Atlantic City, N. J. June 11–15.

New Jersey Section. New Brunswick, N. J. February 7.

New York Section. Sagamore Hotel, Rochester, N. Y. March 30–31.

Kentucky-Tennessee Section. Peabody Hotel, Memphis, Tenn. April 10–12.

Canadian Section. Royal York Hotel, Toronto, Ont. April 12–14.

Montana Section. Great Falls, Mont. April 14–15.

Illinois Section. Urbana-Lincoln Hotel, Urbana, Ill. April 20–22.

Indianapolis Section. Antlers Hotel, Indianapolis, Ind. April 25–26.

Ohio Section. Van Cleve Hotel, Dayton, Ohio. April 27–28.

Pacific-Northwest Section. Tacoma, Wash. May 18–20.

Building Officials Conference of America. Detroit, Mich. May 1–5.

Civil Service Assembly—Eastern Re-